S+S REGELTECHNIK



SENSOR TECHNOLOGY & FIELD DEVICES

Catalogue | 2024

S+S on a focussed path of innovation

Society is digitalising at a rapid pace. Our customers expect solutions for greater ease of use, easier networking and more sustainable environmental sensor technology.

S+S has responded to the zeitgeist and accelerated the pace of its innovations – without compromising on proven functionality.

To this end, we now also offer our fieldbus sensor technology in wireless **W-Modbus** versions, which make it easier to extend and modernise existing building networks in particular. To help regulate a healthy indoor climate, we have expanded the range of **RYM**ASKON® control units to include versions with a touch display and the product family of our **AER**ASGARD® flow sensors has also been extended.

We are also pursuing our determined journey towards sustainability. One of the latest milestones and an incentive for further improvements here at S+S is our environmental certification to ISO 14001. Find out more on the following pages.

Tino Schulze
General Manager
S+S Regeltechnik GmbH®

Heiko Linke
General Manager
S+S Regeltechnik GmbH®



Sustainability as a core strategy

S+S Regeltechnik sees itself as one of the market leaders in the industry in Europe and endeavours to make an exemplary contribution to climate and environmental protection.

With this in mind, we are pursuing a determined sustainability strategy at all levels and throughout the entire value chain – from HR management and procurement to product development, manufacturing, sales and the use of our units.

We see sustainability as a core strategy for everyone's well-being: not just for our environment and the society in which we operate but also for our company and our employees.

Clearly defined priorities

The primary objectives of our strategy include:

- Resource-saving product design
- Maximum energy efficiency in production
- Low-emission manufacturing processes
- Durable and low-maintenance products
- Systematic avoidance of waste
- Considerate personnel management

There is no alternative to the effective continuity of sustainability in all our activities. That is because it has a significant impact on our ecological footprint, on the sustainable benefits of our environmental sensor technology for customers, on our ability to remain competitive in the market and on the working atmosphere at S+S.



Compliance with the UN Sustainable Development Goals

S+S Regeltechnik subscribes to the Sustainable Development Goals of the United Nations and implements them systematically. The current focus is on health and well-being [3], gender equality [5], affordable and clean energy [7], sustainable cities and communities [11], sustainable consumption and production [12] and measures for climate protection [13]:

- We develop and manufacture sustainable-products for a healthy and productive indoor climate.
- Sensor and control units for controlled energy management in favour of less energy consumption and lower pollutant emissions.
- We make use of smart software to optimise and automate energy-efficient and low-emission solutions.
- Our units are durable, multifunctional, thus reducing the consumption of valuable resources.
- The environmentally friendly design of our sensor technology helps to minimise our Scope 1 and Scope 2 emissions as well as the Scope 3 emissions of our customers.*
- The environmental management system of S+S is certified to DIN EN ISO 14001.
- We make sure we provide a healthy and attractive working environment with fair pay, equal development opportunities along with uncompromising protection of personal rights in line with EU regulations.

* Under the Greenhouse Gas Protocol, Scope 1 refers to direct emissions from the company's own production processes, Scope 2 to indirect emissions from purchased energy and Scope 3 to all other indirect emissions from upstream and downstream sources, such as material supplies, packaging and transport.



Produced and translated by the UN Information Service (UNIS), Vienna.

Four milestones to reduce the environmental impact

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Energy conservation

Annual reduction by not less than 5 % measured against net sales

Renewable energy

Up to 100 % in the entire operating environment of the company



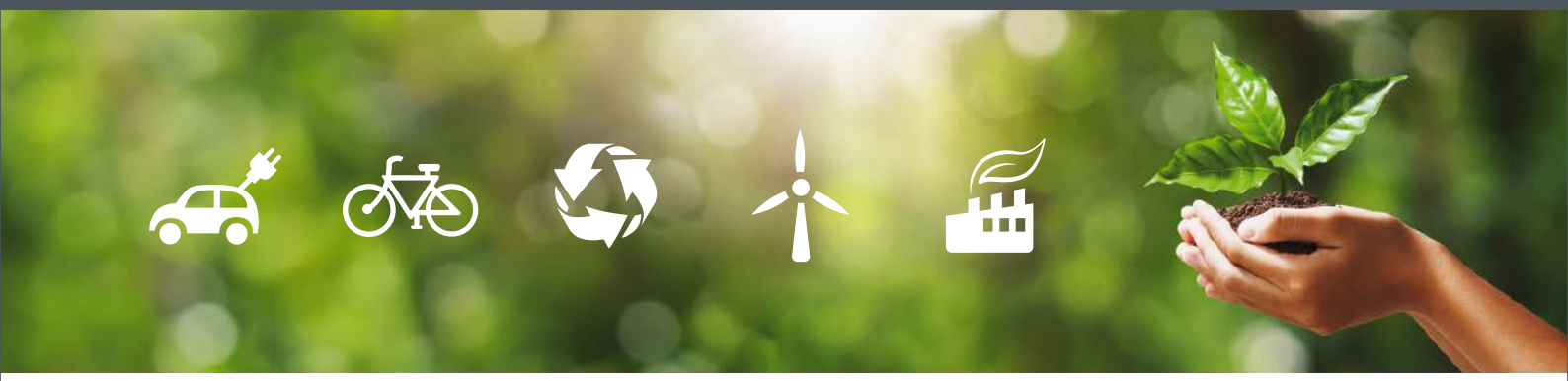


Reduction of emissions

Reduction of the CO2 emissions by approx. 5 %

Environmental certification

All work processes in production, offices, warehouses, packaging and dispatch are certified



S+S Product Groups

ETHER CAT P MEASURING TRANSDUCER

Temperature sensors		
ATM 2 - EtherCATP	Outside temperature sensor	033
TM 65 - EtherCATP	Duct / immersion / screw-in temperature sensor	035
MWTM - EtherCATP	Mean-value temperature sensor	041
HFTM - EtherCATP	Sleeve sensor with cable	043
ALTM 2 - EtherCATP	Surface-contact temperature sensor with cable	045
Humidity sensors		
AFTF - EtherCATP	On-wall humidity/temperature sensor	049
KFTF - EtherCATP	Duct humidity/temperature sensor	053
Pressure sensors		
PREMASGARD® **612x - EtherCATP**	Pressure measuring transducer (Differential pressure, volume flow)	057
Special accessories		
see chapter Accessories		653

EtherCAT® P

Fast standard industrial bus with communication and power on one cable



MODBUS MEASURING TRANSDUCER

Room control units and room controllers with touch keys / touch display			
RYMASKON® **1000**	Room control units (interface)	NEW	075
RYMASKON® **1000**	Room controller	NEW	081
RYMASKON® **2000**	Room control units (interface)	NEW	087
RYMASKON® **2000**	Room controller	NEW	091
RYMASKON® **3000**	Room control units (interface)	NEW	087
Room control units with / without control elements			
RFTF - Modbus-xx	Room control units		093
RTM1 - Modbus	Room control units		095
RFTM - CO2 - Modbus - P	Room control units		155
FSFTM - Modbus - xx	Room control units, In-wall		119/157
Temperature sensors			
RTM1 - Modbus	Room temperature sensor		095
RPTM1 - Modbus - T3	Room pendulum temperature sensor		113
RPTM 2 - Modbus - T3	Room pendulum temperature sensor		115
HFTM - Modbus - T3	Sleeve sensor with cable		107
ALTM1 - Modbus - T3	Surface-contact temperature sensor		109
ALTM 2 - Modbus - T3	Surface-contact temperature sensor with cable		111
ATM 2 - Modbus - T3	Outside temperature sensor		097
TM 65 - Modbus - T3	Duct / immersion / screw-in sensor		101
MWTM - Modbus - T3	Mean-value temperature sensor		105
Humidity sensors			
FSFTM - Modbus	In-wall humidity temperature sensor		119
RFTF - Modbus	Room humidity temperature sensor		117
RPFTF - Modbus - T3	Room pendulum humidity temperature sensor		127
VFTF - Modbus - T3	Showcase humidity temperature sensor		129
AFTF - Modbus - T3	On-wall humidity temperature sensor		121
KFTF - Modbus - T3	Duct humidity temperature sensor		125
TW - Modbus - T3	Dew point control switch		133
Pressure sensors			
PREMASGARD® **232x - Modbus - T3**	Pressure measuring transducer (differential pressure)		137
PREMASGARD® **714x - Modbus**	Pressure measuring transducer (differential pressure, volume flow)		141
PREMASGARD® **724x - Modbus**	Pressure measuring transducer (differential pressure, volume flow) **with dual pressure sensor**		147
PREMASGARD® **814x - Modbus**	Duct sensor for humidity, temperature with pressure measuring transducer (differential pressure, volume flow)		151



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MODBUS MEASURING TRANSDUCER

Air quality sensors CO2, VOC and fine dust sensor

FSFTM-CO2-Modbus	In-wall sensor for humidity, temperature, air quality (VOC), CO2		157
RFTM-LQ-PS-CO2-Modbus	Room sensor for humidity, temperature, air quality (VOC), CO2, and fine dust (PM)		155
AFTM-LQ-CO2-Modbus	On-wall sensor for humidity, temperature, air quality (VOC), CO2		161
KFTM-LQ-CO2-Modbus	Duct sensor for humidity, temperature, air quality (VOC), CO2		165

Flow sensors

KHSSFV-Modbus	Duct top-hat rail sensor (with external duct probe) for airflow and volume flow	NEW	171
KLGF-Modbus	Duct airflow monitor	NEW	169
KLGFVT-Modbus	Duct sensor for airflow, volume flow and temperature	NEW	169

Special accessories

LA-Modbus	Line termination device	173
KA2-Modbus	Communication adapter	175
see chapter Accessories		653

W-MODBUS (WIRELESS) MEASURING TRANSDUCER

Temperature sensors

TM65-wModbus	Duct / immersion / screw-in sensor	NEW	101
RPTM1-wModbus	Room pendulum temperature sensor		online
RPTM2-wModbus	Room pendulum temperature sensor		online
HFTM-wModbus	Sleeve sensor with cable		online
ALTM1-wModbus	Surface-contact temperature sensor		online
ALTM2-wModbus	Surface-contact temperature sensor with cable		online
ATM2-wModbus	Outside temperature sensor		online
MWTM-wModbus	Mean-value temperature sensor		online

Humidity sensors

KFTF-wModbus	Duct humidity temperature sensor	NEW	125
RPFTF-wModbus	Room pendulum humidity temperature sensor		online
VFTF-wModbus	Showcase humidity temperature sensor		online
AFTF-wModbus	On-wall humidity temperature sensor		online
TW-wModbus	Dew point control switch		online

Druckfühler

PREMASGARD® **232x-wModbus**	Pressure measuring transducer (differential pressure)	NEW	137

Gateway (Wireless)

GW-wModbus	W-Modbus gateway	NEW	177

"online" → visit the S+S online shop at www.SplusS.de

TEMPERATURE SENSORS PASSIVE

Room sensors

DTF	In-ceiling temperature sensor	199
RTF	Room temperature sensor, on-wall	182
FSTF	Room temperature sensor, in-wall	192
RPTF1	Room pendulum temperature sensor	256
RPTF2	Room pendulum temperature sensor	257
RSTF	Room radiation temperature sensor	259
RTF-xx	Room control units, on-wall	186
FSTF-xx	Room control units, in-wall	194

Cable sensors, surface-contact sensors, outdoor sensors

HTF	Sleeve temperature sensor with cable	246
OFTF	Surface temperature sensor	251
ALTF1	Surface-contact temperature sensor	252
ALTF2/02	Surface-contact temperature sensor	255/254
ATF1/01	Outside temperature sensor	201/200
ATF2	Outside temperature sensor	203

Duct, immersion, screw-in sensors

TF43/65	Duct / immersion / screw-in sensor	208/206
TF54	Duct / immersion / screw-in sensor	220
MWTF/SD	Mean-value temperature sensor	215
ETF6	Screw-in sensor with neck tube	228
ETF7	Screw-in sensor, fast-acting	217
RGTF2	Smoke gas screw-in sensor	241
RGTF1	Smoke gas duct sensor	235
HTF	Sleeve sensor with cable	246

Radiation temperature sensors

ASTF	On-wall radiation temperature sensor	258
RSTF	Room radiation temperature sensor	259

W-Modbus NEW

Wireless Modbus replaces a conventional RTU cable



Wireless W-Modbus → Onlineshop

TEMPERATURE SENSOR ACTIVE MEASURING TRANSDUCER

Room sensors			
RTM 1	Room temperature measuring transducer	AOS	263
FSTM	Room temperature sensor, in-wall		267
RPTM 1	Room pendulum temperature measuring transducer		329
RPTM 2	Room pendulum temperature measuring transducer		333
Cable sensors, surface-contact sensors, outdoor sensors			
HFTM	Sleeve sensor with measuring transducer	AOS	309
HFTM-VA	Sleeve sensor with measuring transducer (stainless steel housing Tyr 2E)	AOS	313
ALTM 1	Surface-contact temperature measuring transducer	AOS	317
ALTM 2	Surface-contact temperature measuring transducer	AOS	321
ALTM 2-VA	Surface-contact temperature measuring transducer (stainless steel housing Tyr 2E)	AOS	325
ATM 2	Outside temperature measuring transducer	AOS	271
ATM 2-VA	Outside temperature measuring transducer (stainless steel housing Tyr 2E)	AOS	275
Duct, immersion, screw-in sensors			
TM 43/65	Duct / immersion / screw-in temperature measuring transducer		279
TM 54	Duct / immersion / screw-in temperature measuring transducer		289
MWTM/SD	Mean-value temperature measuring transducer	AOS	285
RGTM 1	Smoke gas temperature measuring transducer		297
RGTM 2	Smoke gas temperature measuring transducer		303

TEMPERATURE CONTROLLERS / THERMOSTATS

Room temperature controllers		
RTR-B	Room temperature controller	337
Built-in controllers, duct controllers		
ETR	Built-in temperature controller	345
KTR	Duct temperature controller	351
TR 040/060	Temperature controller	338
TR 22	Temperature controller	339
TR 04040	Temperature controller, two-step	340
TRxx-F	Temperature controller with remote sensor	341
Thermostats		
ALTR xx	Surface-contact thermostats	354/355
FST	Frost protection thermostat, mechanical	359
FST-K	Duct frost protection thermostat, mechanical	363
FS-20	2-phase frost protection thermostat, two-step, switching	367



HUMIDITY SENSORS HUMIDITY CONTROLLERS / HYGROSTATS

Room sensors			
RFF/RFTF	Room humidity sensor, on-wall		375
FSFM/FSFTM	Room humidity sensor, in-wall		377
RPFF-SD	Room pendulum humidity sensor		435
RPFF/RPFTF	Room pendulum humidity sensor		439
RPFF/RPFTF-25	Room pendulum humidity sensor, pluggable		443
VFF/VFTF	Showcase humidity sensor		447
DFF/DFTF	In-ceiling humidity sensor		381
On-wall sensors, outdoor sensors			
AFF/AFTF-SD	On-wall humidity sensor		385
AFF/AFTF	On-wall humidity sensor		390
AFF/AFTF-20	On-wall humidity sensor		393
AFF/AFTF-25	On-wall humidity sensor, pluggable		391
AFTF-20-VA	On-wall humidity sensor (stainless steel housing Tyr 2E)		399
AFTF-35	On-wall humidity sensor **for high humidity**	NEW	403
AAVTF	On-wall humidity sensor		407
Duct sensors			
KFF/KFTF-SD	Duct humidity sensor		412
KFF/KFTF	Duct humidity sensor		413
KFF/KFTF-20	Duct humidity sensor		415
KFTF-20-VA	Duct humidity sensor (stainless steel housing Tyr 2E)		421
KFTF-35	Duct humidity sensor **for high humidity**	NEW	425
KAVTF	Duct humidity sensor		429
ESFTF	Screw-in humidity sensor **for pressure systems**	NEW	433
Hygrostats			
KH-10	Duct hygrostat, one-step		459
KH-40	Duct hygrostat, one-step		461
AH-40	On-wall hygrostat, one-step		453
Hygrothermostat			
RHT-30	Room hygrothermostat, two-step		451
KHT-30	Duct hygrothermostat, two-step		465
AHT-30	On-wall hygrothermostat, two-step		457
Control switches			
KW/KW-SD	Condensation control switch		469/468
TW	Dew point control switch		473
LS	Leakage sensor		475

IMMERSION SLEEVES ACCESSORIES / SPARE PARTS

Immersion sleeves		
TH 08	Immersion sleeves for temperature sensors	638
TH	Immersion sleeves for temperature sensors	640
THR	Immersion sleeves for temperature controllers	642
THE	Immersion sleeves for sleeve sensors	644
Mounting accessories		
MF-xx	Mounting flanges	646/647
KRD-04	Capillary tube leadthrough, plastic	646
MK-xx	Mounting clamps	647
ESSH	Welding protection sleeve	648
WS-xx	Protection hoods, stainless steel	650
Others		
see chapter Accessories		646

PRESSURE SENSORS
PRESSURE CONTROLLERS / SWITCHES

for gaseous media		
PREMASGARD® **111x / 112x / SD**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	**490/491**
PREMASGARD® **211x / 212x / SD**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	**485/484**
PREMASGARD® **711x**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	**497**
PREMASGARD® **711x-VA**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor (stainless steel housing Tyr 2E)	**503**
PREMASGARD® **722x**	Pressure measuring transducer [mbar/Pa], Differential pressure sensor **with dual pressure sensor**	**509**
PREMASREG® **711x**	Pressure measuring transducer [mbar/Pa], Differential pressure switch	**515**
PREMASREG® **711x-VA**	Pressure measuring transducer [mbar/Pa], Differential pressure switch (stainless steel housing Tyr 2E)	**521**
ALD	Measuring transducer [mbar], Atmospheric pressure	**535**
DS 1 / DS2	Differential pressure switch [mbar/Pa]	**539**
for volume flow		
PREMASREG® **716x**	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch	**527**
PREMASREG® **716x-VA**	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch (stainless steel housing Tyr 2E)	**533**
for liquid media		
SHD / SHD-SD	Pressure measuring transducer [bar]	**541**
SHD-692	Pressure measuring transducer [bar]	**543**

LIGHT INTENSITY SENSORS
MOTION DETECTORS / PRESENCE DETECTORS

Light intensity sensors		
AHKF	Outdoor light intensity sensor	**553**
RHKF	Room light intensity sensor	**552**
FSHKM	Room light intensity sensor, in-wall	**551**
DHKF	In-ceiling light intensity sensor	**555**
Motion detectors		
ABWF	Outdoor motion detector	**559**
RBWF	Room motion detector	**558**
FSBWF-W	Room motion detector, in-wall	**557**
DBWF/DBWF-C	In-ceiling motion detector	**561**
Motion and light intensity sensors		
ABWF/LF	Outdoor motion detector/light intensity sensor	**565**
RBWF/LF	Room motion detector/light intensity sensor	**563**
DBWF/LF/FTF	In-ceiling sensor for temperature, humidity, motion and light intensity	**567**

AIRFLOW MONITORS
FLOW SENSORS / CONTROLLERS

Airflow monitors, electronic		
KLSW/KLGF	Duct airflow monitor	NEW **631**
KLGFVT	Duct monitor for airflow, Volume flow and temperature	NEW **631**
KHSSF/KHSSW	Duct top-hat rail airflow monitor (with external duct probe)	NEW **627**
Flow monitors, mechanical		
WFS	Wind vane switch	**633**
SW	Flow monitor	**635**

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AIR QUALITY SENSORS

Gas mixture sensor (VOC)		
RLQ-SD	Room air quality sensor	**577**
RLQ-W	Room air quality sensor	***577**
FSLQ	Room air quality sensor, in-wall	**597**
KLQ-SD	Duct air quality sensor	**611**
KLQ-W	Duct air quality sensor	***611**
Carbon dioxide sensor (CO2)		
FSCO2	Room CO2 sensor, in-wall	**595**
FSTM-CO2	Room temperature / CO2 sensor, in-wall	**595**
RCO2-AS xx	**CO2 traffic light with signal tone**, table-top unit with plug-in power supply unit, wall unit with/without power supply unit	**581**
RCO2-SD	Room CO2 sensor	**585**
RCO2-W	Room CO2 sensor	***585**
RCO2-W-A	Room CO2 sensor with LED display	***585**
RPCO2-W	Room pendulum CO2 sensor	NEW **623**
RTM-CO2-SD	Room temperature / CO2 sensor	**589**
RFTM-CO2-W	Room humidity / temperature / CO2 sensor	***589**
ACO2-SD	On-wall CO2 sensor	**599**
ACO2-W	On-wall CO2 sensor	***599**
ATM-CO2-SD	On-wall temperature / CO2 sensor	**605**
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	***605**
KCO2-SD	Duct CO2 sensor	**615**
KCO2-W	Duct CO2 sensor	***615**
KTM-CO2-SD	Duct temperature / CO2 sensor	**621**
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	***621**
Fine dust sensor (PM)		
RPS-SD	Room fine dust sensor	**593**
RFTM-PS-W	Room humidity / temperature / fine dust sensor	**593**
APS-SD	On-wall fine dust sensor	**607**
Multifunctional air quality sensor (VOC / CO2 / PM)		
RLQ-CO2-W	Room air quality CO2 sensor	***589**
RFTM-LQ-CO2-W	Room humidity / temperature / air quality / CO2 sensor	***589**
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor	***593**
ALQ-CO2-W	On-wall air quality / CO2 sensor	***605**
AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor	***605**
KLQ-CO2-W	Duct air quality / CO2 sensor	***621**
KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor	***621**

***W** with changeover contact

Can't find the unit type?
You can find more products in the S+S online shop at **www.SplusS.de**

S+S Products A-Z

TYP		SEITE
A		
AAVTF	Outdoor humidity sensor	407
ABWF	Outdoor motion detector	559
ABWF/LF	Outdoor motion detector and light sensor	565
ACO2-Modbus	On-wall CO2 sensor	161
ACO2-SD	On-wall CO2 sensor	599
ACO2-W	On-wall CO2 sensor	599
AFF	On-wall humidity sensor	390
AFF-20	On-wall humidity sensor	393
AFF-25	On-wall humidity sensor, pluggable	391
AFF-SD	On-wall humidity sensor	385
AFTF	On-wall humidity / temperature sensor	390
AFTF-20	On-wall humidity / temperature sensor	393
AFTF-20-VA	On-wall humidity / temperature sensor (stainless steel housing Tyr 2E)	399
AFTF-25	On-wall humidity / temperature sensor, pluggable	391
AFTF-35	On-wall humidity / temperature sensor for high humidity NEW	403
AFTF-EtherCATP	On-wall humidity / temperature sensor	049
AFTF-Modbus-T3	On-wall humidity / temperature sensor	121
AFTF-SD	On-wall humidity / temperature sensor	385
AFTM-CO2-Modbus	On-wall humidity / temperature / CO2 sensor	161
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	605
AFTM-LQ-CO2-Modbus	On-wall humidity / temperature / air quality / CO2 sensor	161
AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor	605
AHKF	Outdoor light intensity sensor	553
AH-40	On-wall hygrostat, one-step	453
AHT-30	On-wall hygrothermostat, two-step	457
ALD	Measuring transducer for atmospheric pressure	535
ALQ-CO2-Modbus	On-wall air quality / CO2 sensor	161
ALQ-CO2-W	On-wall air quality / CO2 sensor	605
ALTF 1	Surface-contact temperature sensor	252
ALTF 02	Surface-contact temperature sensor	254
ALTF 2	Surface-contact temperature sensor	255
ALTM 1	Surface-contact temperature measuring transducer	317
ALTM 1-Modbus-T3	Surface-contact temperature measuring transducer	109
ALTM 2	Surface-contact temperature measuring transducer	321
ALTM 2-EtherCATP	Surface-contact temperature measuring transducer	045
ALTM 2-Modbus-T3	Surface-contact temperature measuring transducer	111
ALTM 2-VA	Surface-contact temperature measuring transducer (stainless steel housing Tyr 2E)	325
ALTR 060	Surface-contact thermostats	354
ALTR 090	Surface-contact thermostats	354
ALTR 1	Surface-contact thermostats	355
ALTR 3	Surface-contact thermostats	355

TYP		SEITE
ALTR 5	Surface-contact thermostats	355
ALTR 7	Surface-contact thermostats	355
APS-SD	On-wall fine dust sensor	607
ASTF	On-wall radiation temperature sensor	258
ATF 01	On-wall temperature sensor	200
ATF 1	On-wall temperature sensor	201
ATF 2	On-wall temperature sensor	203
ATM 2	On-wall temperature measuring transducer	271
ATM 2-EtherCATP	On-wall temperature measuring transducer	033
ATM 2-Modbus-T3	On-wall temperature measuring transducer	097
ATM 2-VA	On-wall temperature measuring transducer (stainless steel housing Tyr 2E)	275
ATM-CO2-SD	On-wall temperature / CO2 sensor	605
D		
DBWF	In-ceiling motion detector	561
DBWF-C	In-ceiling motion detector	561
DBWF/LF/FTF	In-ceiling motion detector / light / temperature / humidity sensor	567
DFF	In-ceiling humidity sensor	381
DFTF	In-ceiling humidity sensor	381
DHKF	In-ceiling light intensity sensor	555
DTF	In-ceiling temperature sensor	199
DS 1	Differential pressure switch	539
DS 2	Differential pressure switch	539
E		
ESFTF	Screw-in humidity sensor for pressure systems NEW	433
ETF 6	Screw-in sensor	228
ETF 7	Screw-in sensor	217
ETR	Built-in temperature controller	345
F		
FS-20	2-phase frost protection thermostat	367
FSBWF-W	In-wall motion detector	557
FSCO2	In-wall CO2 sensor	595
FSFM	In-wall humidity sensor	377
FSFTM	In-wall humidity / temperature sensor	377
FSFTM-CO2-Modbus	In-wall humidity / temperature / CO2 sensor	157
FSFTM-Modbus	In-wall humidity / temperature sensor	119
FSHKM	In-wall light intensity sensor	551
FSLQ	In-wall air quality sensor	597
FST	Frost protection thermostat, mechanical	359
FST-K	Duct frost protection thermostat, mechanical	363
FSTF	In-wall temperature sensor	192
FSTF-xx	Room control units, in-wall	194
FSTM	In-wall temperature sensor	267
FSTM-CO2	In-wall temperature / CO2 sensor	595
G		
GW-wModbus	W-Modbus gateway NEW	177
H		
HFTM	Sleeve sensor with measuring transducer	309
HFTM-EtherCATP	Sleeve sensor with measuring transducer	043
HFTM-Modbus-T3	Sleeve sensor with measuring transducer	107
HFTM-VA	Sleeve sensor with measuring transducer (stainless steel housing Tyr 2E)	313
HTF-50	Sleeve temperature sensor	246
HTF-200	Sleeve temperature sensor, duct / immersion / screw-in sensor with cable	248

TYP		SEITE
K		
KA2-Modbus	Communication adapter	**175**
KAVTF	Duct humidity sensor	**429**
KCO2-Modbus	Duct CO2 sensor	**165**
KCO2-SD	Duct CO2 sensor	**615**
KCO2-W	Duct CO2 sensor	**615**
KFF	Duct humidity sensor	**413**
KFF-20	Duct humidity sensor	**415**
KFF-SD	Duct humidity sensor	**412**
KFTF	Duct humidity / temperature sensor	**413**
KFTF-20	Duct humidity / temperature sensor	**415**
KFTF-20-VA	Duct humidity / temperature sensor (stainless steel housing Tyr 2E)	**421**
KFTF-35	Duct humidity / temperature sensor for high humidity NEW	**425**
KFTF-EtherCATP	Duct humidity / temperature sensor	**053**
KFTF-Modbus-T3	Duct humidity / temperature sensor	**125**
KFTF-wModbus	Duct humidity / temperature sensor NEW	**125**
KFTF-SD	Duct humidity / temperature sensor	**412**
KFTM-CO2-Modbus	Duct humidity / temperature / CO2 sensor	**165**
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	**621**
KFTM-LQ-CO2-Modbus	Duct humidity / temperature / air quality / CO2 sensor	**165**
KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor	**621**
KH-10	Duct hygrostat, one-step	**459**
KH-40	Duct hygrostat, one-step	**461**
KHT-30	Duct hygrothermostat, two-step	**465**
KHSSFT-Modbus	Duct top-hat rail monitor for airflow, volume flow and temperature NEW	**171**
KHSSF	Duct top-hat rail airflow monitor NEW	**627**
KHSSW	Duct top-hat rail airflow monitor NEW	**627**
KLGF	Duct airflow monitor NEW	**631**
KLGF-Modbus	Duct airflow monitor NEW	**631**
KLGFVT	Duct monitor for airflow, volume flow and temperature NEW	**631**
KLGFVT-Modbus	Duct monitor for airflow, volume flow and temperature NEW	**169**
KLSW	Duct airflow monitor NEW	**631**
KLQ-CO2-Modbus	Duct air quality / CO2 sensor	**165**
KLQ-CO2-W	Duct air quality / CO2 sensor	**621**
KLQ-SD	Duct air quality sensor	**611**
KLQ-W	Duct air quality sensor	**611**
KTM-CO2-SD	Duct temperature / CO2 sensor	**621**
KTR	Duct temperature controller	**351**
KW	Condensation control switch	**469**
KW-SD	Condensation control switch	**468**
L		
LA-Modbus	Line termination device	**173**
LS	Leakage sensor	**475**
M		
MWTF	Mean-value temperature sensor	**215**
MWTF-SD	Mean-value temperature sensor	**215**
MWTM	Mean-value temperature measuring transducer	**285**
MWTM-SD	Mean-value temperature measuring transducer	**285**
MWTM-EtherCATP	Mean-value temperature sensor	**041**
MWTM-Modbus-T3	Mean-value temperature sensor	**105**
O		
OFTF	Surface temperature sensor	**251**

TYP		SEITE
P		
PREMASGARD® **111x**	Pressure measuring transducer, compact design	**491**
PREMASGARD® **112x**	Pressure measuring transducer, compact design	**491**
PREMASGARD® **112x-SD**	Pressure measuring transducer, compact design	**490**
PREMASGARD® **211x**	Pressure measuring transducer, compact design	**485**
PREMASGARD® **212x**	Pressure measuring transducer, compact design	**485**
PREMASGARD® **212x-SD**	Pressure measuring transducer, compact design	**484**
PREMASGARD® **232x-Modbus-T3**	Pressure measuring transducer	**137**
PREMASGARD® **232x-wModbus**	Pressure measuring transducer NEW	**137**
PREMASGARD® **612x-EtherCATP**	Pressure measuring transducer (differential pressure, volume flow)	**057**
PREMASGARD® **711x**	Pressure measuring transducer	**497**
PREMASGARD® **711x-VA**	Pressure measuring transducer (stainless steel housing Tyr 2E)	**503**
PREMASGARD® **714x-Modbus**	Pressure measuring transducer (differential pressure, volume flow)	**141**
PREMASGARD® **722x**	Pressure measuring transducer (differential pressure) **with dual pressure sensor**	**509**
PREMASGARD® **724x-Modbus**	Pressure measuring transducer (differential pressure, volume flow) **with dual pressure sensor**	**147**
PREMASREG® **711x**	Pressure measuring transducer / switch	**515**
PREMASREG® **711x-VA**	Pressure measuring transducer / switch (stainless steel housing Tyr 2E)	**521**
PREMASREG® **716x**	Volume flow sensor, Pressure measuring transducer / switch	**527**
PREMASREG® **716x-VA**	Volume flow sensor, Pressure measuring transducer / switch (stainless steel housing Tyr 2E)	**533**
PREMASGARD® **814x-Modbus**	Duct humidity / temperature sensor with pressure measuring transducer (differential pressure, volume flow)	**151**
R		
RBWF	Room motion detector	**558**
RBWF/LF	Room motion and light detector	**563**
RCO2-AS NT ST	**CO2 traffic light with signal tone**, table-top unit with plug-in power supply unit, stainless steel stand	**581**
RCO2-AS NT	**CO2 traffic light with signal tone**, wall unit with plug-in power supply unit	**581**
RCO2-AS UPNT	**CO2 traffic light with signal tone**, wall unit with in-wall power supply unit	**581**
RCO2-AS	**CO2 traffic light with signal tone**, wall unit without power supply unit	**581**
RCO2-Modbus	Room CO2 sensor	**155**
RCO2-SD	Room CO2 sensor	**585**
RCO2-W	Room CO2 sensor	**585**
RCO2-W-A	Room CO2 sensor with LED display	**585**
RFF	Room humidity sensor	**375**

TYP			SEITE
RFTF	Room humidity / temperature sensor		375
RFTF-Modbus	Room humidity / temperature sensor		117
RFTF-Modbus-xx	Room control units		093
RFTM-CO2-Modbus	Room humidity / temperature / CO2 sensor		155
RFTM-CO2-W	Room humidity / temperature / CO2 sensor		589
RFTM-LQ-CO2-Modbus	Room humidity / temperature / air quality / CO2 sensor		155
RFTM-LQ-PS-CO2-Modbus	Room humidity / temperature / air quality / fine dust / CO2 sensor		155
RFTM-LQ-CO2-W	Room humidity / temperature / air quality / CO2 sensor		589
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor		593
RFTM-PS-W	Room humidity / temperature / fine dust sensor		593
RGTF 1	Smoke gas temperature sensor		235
RGTF 2	Smoke gas temperature sensor		241
RGTM 1	Smoke gas temperature measuring transducer		297
RGTM 2	Smoke gas temperature measuring transducer		303
RHKF	Room light intensity sensor		552
RHT-30	Room hygrothermostat, two-step		451
RLQ-CO2-Modbus	Room air quality / CO2 sensor		155
RLQ-CO2-W	Room air quality / CO2 sensor		589
RLQ-SD	Room air quality sensor		577
RLQ-W	Room air quality sensor		577
RPCO2	Room pendulum CO2 sensor	NEW	623
RPFF	Room pendulum humidity sensor		439
RPFF-25	Room pendulum humidity sensor, pluggable		443
RPFF-SD	Room pendulum humidity sensor		435
RPFTF	Room pendulum humidity / temperature sensor		439
RPFTF-25	Room pendulum humidity / temperature sensor, pluggable		443
RPFTF-Modbus-T3	Room pendulum humidity / temperature sensor		127
RPS-SD	Room fine dust sensor		593
RPTF 1	Room pendulum temperature sensor		256
RPTF 2	Room pendulum temperature sensor		257
RPTM 1	Room pendulum temperature measuring transducer		329
RPTM 1-Modbus-T3	Room pendulum temperature sensor		113
RPTM 2	Room pendulum temperature measuring transducer		333
RPTM 2-Modbus-T3	Room pendulum temperature sensor		115
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RTF	Room temperature sensor		182
RTF-xx	Room control units		186
RTM 1	Room temperature measuring transducer		263
RTM 1-Modbus	Room control units		095
RTM-CO2-SD	Room temperature CO2 sensor		589
RTR-B	Room temperature controller		337
RYMASKON®1000	Room control units (Interface)	NEW	075
RYMASKON®1000	Room controller (Controller)	NEW	081
RYMASKON®2000	Room control units (Interface)	NEW	087
RYMASKON®2000	Room controller (Controller)	NEW	091
RYMASKON®3000	Room control units (Interface)	NEW	087
S			
SHD	Pressure measuring transducer	NEW	541
SHD-SD	Pressure measuring transducer	NEW	541
SHD 692	Differential pressure transmitter	NEW	543
SW	Flow monitor		635

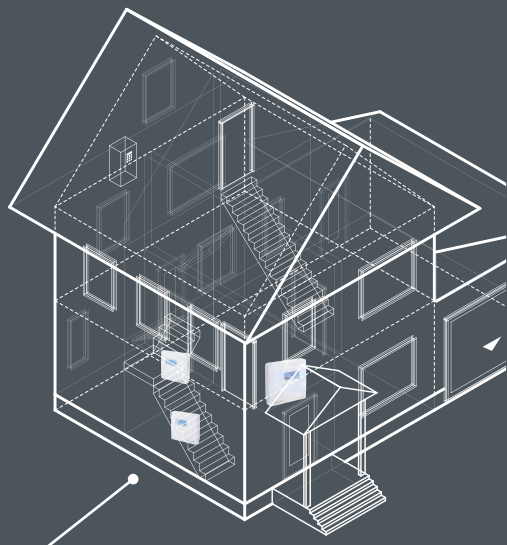
TYP			SEITE
T			
TF 43	Duct / immersion / screw-in sensor		208
TF 54	Duct / immersion / screw-in sensor		220
TF 65	Duct / immersion / screw-in sensor		206
TM 54	Duct / immersion / screw-in sensor		289
TM 43	Duct / immersion / screw-in sensor		279
TM 65	Duct / immersion / screw-in sensor		279
TM 65-EtherCATP	Duct / immersion / screw-in sensor		035
TM 65-Modbus-T3	Duct / immersion / screw-in sensor		101
TM 65-wModbus	Duct / immersion / screw-in sensor	NEW	101
TR 22	Temperature controller		339
TR 040	Temperature controller		338
TR 04040	Temperature controller, two-step		340
TR 060	Temperature controller		338
TR xx-F	Temperature controller with remote sensor		341
TW	Dew point control switch		473
TW-Modbus-T3	Dew point control switch		133
V			
VFF	Showcase humidity sensor		447
VFTF	Showcase humidity / temperature sensor		447
VFTF-Modbus-T3	Showcase humidity / temperature sensor		129
W			
WFS	Wind vane switch		633
Accessories			
ASD-06	Connection set		649
ASD-07	Connection nipple (90°)		649
ASS-UV	Connecting hose, UV-resistant		649
DAL	Pressure outlet		649
DS-MW	Mounting bracket, sheet steel		649
ESSH	Welding protection sleeve		648
HS-Adapter	Universal bracket (top-hat rails)		651
KRD-04	Capillary tube leadthrough, plastic		646
MF-xx-K	Mounting flanges, plastic		646
MF-xx-M	Mounting flanges, metal		647
MFT-20-K	Mounting flanges, plastic		646
MK-xx	Mounting clamps		647
Modbus-Y	Y-adapter for cable gland		651
SF-xx	Sinter filter, replaceable		651
TH-Adapter-HW	Immersion sleeve adapter		648
TH 08	Immersion sleeves		638
TH	Immersion sleeves		640
THE	Immersion sleeves		644
THR	Immersion sleeves		642
PSW-09	Stainless steel paddle (SW)		651
PWFS-08	Stainless steel vane (WFS)		651
WLP-1	Heat-conductive paste, silicone-free		651
WS-xx	Protection hoods, stainless steel		650
BASIC	Preference programme		662 - 669

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You can find more products in the S+S online shop at **www.SplusS.de**

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NEW

RYMASKON® 1000 / 2000 / 3000

The perfect solution for intelligent individual room control

For the extended product family of modern individual room control units **RYM**ASKON® **1000 / 2000 / 3000**, we have developed our new Iduna housing series. in a timeless look with high-quality surfaces in white and black.

The graphic **design** with international symbols and multiple languages offers the perfect solution for all visible areas in the building. Intuitive operation is via touch keys or touch screen.

High-contrast **colour displays** with strong LED backlighting allow effortless reading up to a viewing angle of 85°. even under unfavourable conditions, such as strong solar irradiation.

It also **saves power** with features such as automatic brightness adjustment, stand-by mode or wake-up function using hand gestures.

The room climate can be monitored in up to 5 zones via the integrated **sensor technology**. The ability to detect open windows and a programmable reset function round out the features, which include the control of temperature, fan, sun protection and lighting. In this way, buildings can be operated in an **energy-optimised** and **environmentally-friendly** manner.



INTEGRATED SENSOR TECHNOLOGY



INTUITIVE CONTROL

Interface and controller variants are available with a wide range of technical options. Optionally with communication interface (Modbus, BACnet, KNX) or with active outputs (0-10 V).

Further **information** on the new **RYM**ASKON unit series can be found on the following pages.

Technical details from page 070

RYMASKON® **3000**
5,0" TFT touch display (Iduna 5 housing)

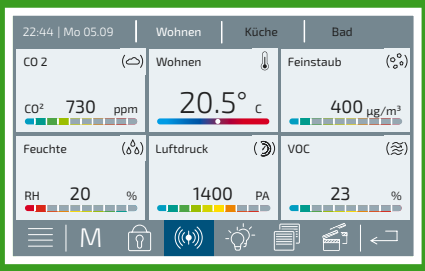
RYMASKON® **2000**
4,3" TFT touch display (Iduna 4 housing)

RYMASKON® **1000**
2,0" TFT display or LEDs, touch keys
(Iduna 1/2/3 housing)

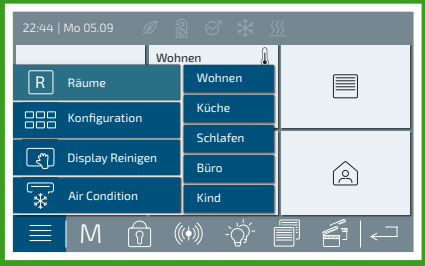


S+S ADDED VALUE

- Timeless design in the elegant Iduna housing (white or black colour)
- Intuitive operation with modern graphics via touch keys or touch screen
- Integrated environment sensor technology enables energy-efficient room ventilation and a comfortable climate
- Power-saving and environmentally friendly thanks to features, such as automatic brightness adjustment and reset, stand-by, wake-up, time control, etc.
- Extensive room lighting control with dimming function and advanced colour settings
- Many standard languages for menu control (DE, EN, FR, ES, IT, RU, others available upon request)
- Quick and easy installation (push-in terminals) and mounting (on in-wall flush box or on-wall)
- Wide range of configuration options







NEW

RYMASKON® 1000
Compact and flexible

RYMASKON® **1000** series of room control units are designed to control **temperature, fans, sun protection** and **lighting** in offices, homes and hotels.

Two compact housing sizes with colour TFT display (2.0") or LED display are available. Operation is intuitive via capacitive **touch keys** in combination with international symbols and a wide choice of languages.

In addition to temperature and fan **control**, there are two pairs of keys available for sun protection and room lighting.

The integrated **sensors** (temperature, humidity, CO2, VOC) support room control with **limit value** monitoring.

The units can be seamlessly integrated into an existing building management system (BMS). Optionally with communication interface (Modbus, BACnet, KNX) or with active outputs (0-10 V).

The **RYM**ASKON® **1000 Controller** can also be operated as a stand-alone solution thanks to the integrated control functions (PI, PWM, 2-point or 3-point control). The controller can be used with all common heating/cooling systems in room climate technology, e.g. for controlling heating convectors, fan coils, cooling ceilings or floor heating.







RYMASKON® **1000 Interface**
RYMASKON® **1000 Controller**

Housing variants (Iduna 1/2/3)
with 2,0" display or LED display, touch keys
(adjusting wheels available upon request)



HIGHLIGHTS 1000

- 2,0" TFT display (320 x 240 x 3 RGB pixels) with LED backlighting, high contrast, 85° viewing angle
- 10 capacitive keys (freely configurable) alternatively with adjusting wheels (available upon request)
- 2 housing sizes available (92 x 82 mm and 110 x 88 mm)
- Integrated sensor technology (temperature, humidity, CO2, VOC) with limit value monitoring
- Control of temperature, fan, sun protection (max. 2 circuits) and lighting with dimming function
- Bus capable communication (Modbus, BACnet, KNX) or active outputs (0-10 V)
- Controller unit type for heating convectors and fan coils, with continuous output (0-10 V) or with 2-point or 3-point regulation (relay) for 2-pipe and 4-pipe systems
- Other configuration options

More details from page 070

NEW

RYMASKON® 2000/3000

Versatile and smart

RYMASKON® **2000/3000** series of room control units are designed to control **temperature, fans, sun protection** and **lighting** in up to 5 climate zones (rooms); specially designed for offices, practices, restaurants, hotels and smart homes.

Choice of two housing formats with large TFT colour displays (4.3" or 5.0"). Intuitive operation on a **touch screen** with international symbols and a wide choice of languages.

Besides the control of **temperature** and **fan**, they also provide 4 or 20 circuits each for **sun protection** and **lighting** (with dimming function).

The integrated **sensors** (temperature, humidity, CO2, VOC) support room control with **limit value** monitoring.

The units can be seamlessly integrated into an existing building management system (BMS). Optionally with communication interface (Modbus, BACnet, KNX) or with active outputs (0-10 V).

The **RYM**ASKON® **2000 Controller** can also be operated as a stand-alone solution thanks to the integrated control functions (PI, PWM, 2-point or 3-point control). The controller can be used with all common heating/cooling systems in room climate technology, e.g. for controlling heating convectors, fan coils, cooling ceilings or floor heating.



RYMASKON® **2000 Interface**
RYMASKON® **2000 Controller**
with 4.3" display, Iduna 4 housing

RYMASKON® **3000 Interface**
with 5.0" display, Iduna 5 housing









Further information upon request

HIGHLIGHTS 2000

- 4.3" TFT display (800 x 480 x 3 RGB pixels) with LED backlighting, high contrast, 85° viewing angle
- High-performance Quad Core CPU with 1.5 GHz, 512 MB RAM and 4 GB memory
- Iduna 4 housing (approx. 129 x 88 mm)
- Integrated sensor technology (temperature, humidity, CO2, VOC) with limit value monitoring
- Control of temperature and ventilation
- Control of 4 circuits each for sun protection and lighting
- Freely configurable function icons (e.g. lighting or sun protection)
- 8 scenes with start and end time (e.g. meeting, cinema, holiday, etc.)
- 'Please do not disturb' (e.g. in hotels, offices, practices)
- Bus capable communication (Modbus, BACnet, KNX) or active outputs (0-10 V)
- Controller unit type for heating convectors and fan coils, with continuous output (0-10 V) or with 2-point or 3-point regulation (relay) for 2-pipe and 4-pipe systems
- Other configuration options

UPGRADE 3000

- 5.0" TFT display (800 x 480 x 3 RGB pixels)
- Iduna 5 housing (approx. 143 x 98 mm)
- Control of 20 circuits each for sun protection and lighting
- Additional multi-room control (up to 5 rooms)

NEW

W-MODBUS – Wireless Modbus replaces a conventional RTU cable

Our new units with integrated W-Modbus technology provide the data points via radio. This means that there is no need for a conventional bus cable, while the Modbus RTU standard remains fully intact.

A wireless mesh topology is set up with the W-Modbus, offering maximum installation flexibility.

All units are connected to each other and thus help ensure that they cover an entire building.

The new W-Modbus technology creates a wireless Modbus RTU network that maintains the standardisation of the protocol and transmits the Modbus RTU signal wirelessly with low latency.

Patented functions enable extremely reliable and secure wireless communication, fast installation and extended ranges – even if a device in the mesh should fail.

Technical details from page 068

HIGHLIGHTS

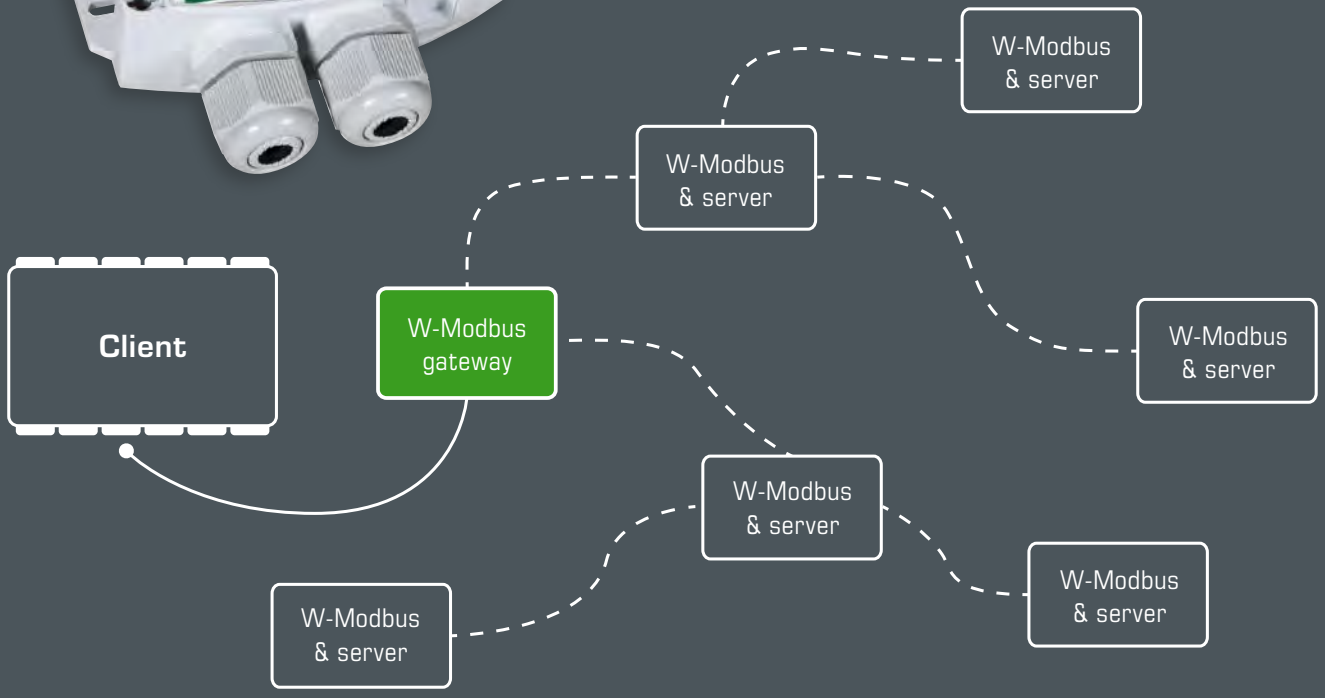
- Wireless Modbus RTU architecture for smart HVAC and building automation
- Licence-free ISM band at 2.4 GHz
- Up to 100 units (nodes) in a shared mesh topology
- Signal transmission at low latency
- Long range up to 500 m (line of sight) by sending and forwarding data points (up to 8 hops)
- Ideal for refurbishment / retrofitting in the field and in rooms
- Reduced costs and time required for wiring (no data cable required), installation planning, troubleshooting
- Quick installation (push-in terminals) and easy mounting on in-wall flush box or on-wall
- Immediate commissioning in 3 steps (e.g. set address only, no further bus parameters necessary)
- Many standard languages for menu control (DE, EN, FR, ES, IT, RU, others available upon request)

W-Modbus

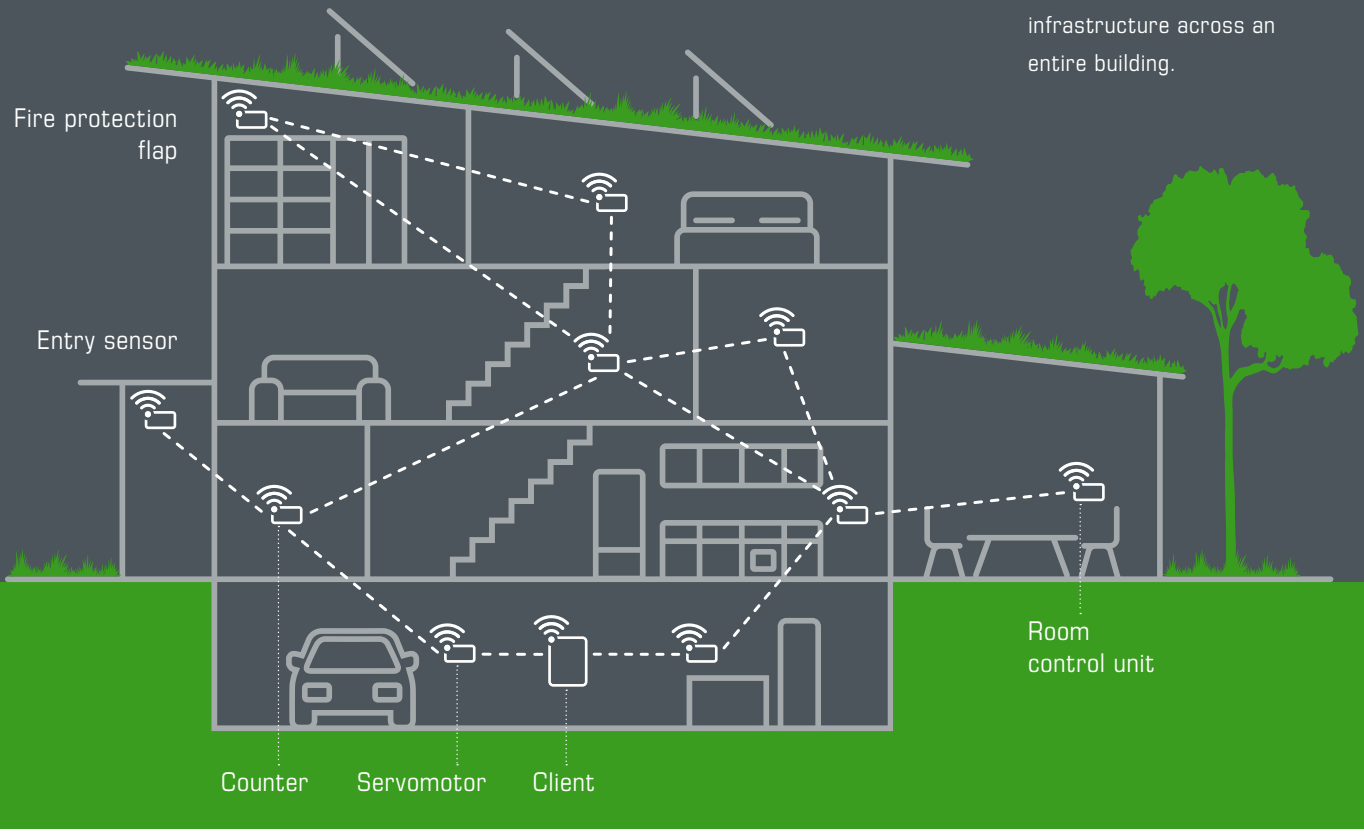
WIRELESS FIELDBUS SOLUTIONS FOR SMART BUILDINGS



The W-Modbus network consists of up to 100 network nodes and one **W-Modbus gateway**. This converts the radio signals and transmits the Modbus RTU protocol to the client via data cable.



W-Modbus makes it easy to extend the network infrastructure across an entire building.



NEW

RHEASGARD® & RHEASREG®

Electronic air flow sensors for flow velocity, temperature and volume flow

Our new product family of precise airflow sensors increases well-being and improves energy efficiency. Besides the duct sensor, there are further housing variants available with an external duct probe for on-wall or top-hat rail mounting.

The electronic sensor detects the **flow velocity** (0.1 ... 20 m/s). It is suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

The **volume flow** (by way of simple calculation using the **duct cross-section** and the flow velocity) and the **temperatur** can be retrieved as additional parameters depending on the type.

For technical details see product section

KLGF-U
KLGF(VT)-W (AOS)
KLGF(VT)-Modbus
KLSW-W24
KLSW-W230



HIGHLIGHTS

- Precise flow sensor (calorimetric, calibratable, temperature-compensated) with sensor breakage protection
- Measuring range 0.1...20 m/s with start-up override
- Other parameters: temperature and volume flow
- Measuring transducer with active output or Modbus connection (RTU)
- Changeover contact with automatic reset
- **Monitor** for voltage supply **24 V** AC/DC or **230 V** AC

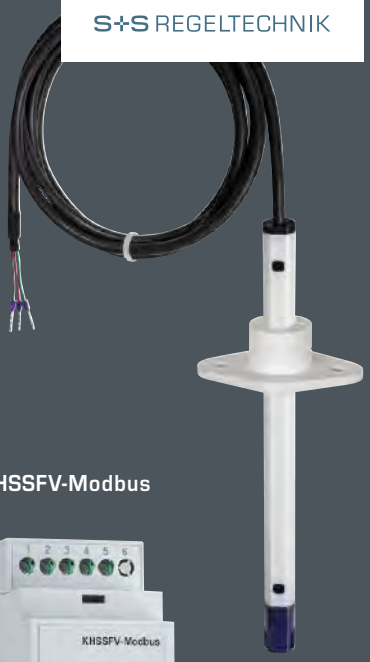
Automatic Detection and Switching to 0...10 V or 4...20 mA standard signal

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



Alternative designs:
Top-hat rail housing
(2TE for 35 mm mounting rail)
or on-wall housing (Tyr 2)
with external duct probe
for flow velocity, volume flow
and temperature

Modbus



NEW

PLGF-U
PLGF(VT)-W (AOS)
PLGF(VT)-Modbus
PLSW-W24

KHSSF-W
KHSSW-W24
KHSSW-W230



KHSSFV-Modbus



NEW

Voltage supply	Output active / Modbus	Output switching	Additional parameters	Housing **Tyr 2** with duct tube (Pleuroform)	Housing **Tyr 2** (on-wall) + external probe	**Top-hat rail housing** + external probe
RHEASGARD® Airflow sensor				**KLGF-U**	**PLGF-U**	
24 V AC / DC	0-10 V	–	–	■ □	■ □	–
RHEASGARD® Airflow sensor (AOS)				**KLGF(VT)-W**	**PLGF(VT)-W**	**KHSSF-W**
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	–	–	–	●
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	**T**	■ □	■ □	–
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	**T | V**	■ □	■ □	–
RHEASGARD® Airflow sensor (Modbus)				**KLGF(VT)-Modbus**	**PLGF(VT)-Modbus**	**KHSSFV-Modbus**
24 V AC / DC	Modbus RTU	–	–	■ □	■ □	–
24 V AC / DC	Modbus RTU	–	**T | V**	■ □	■ □	●
RHEASREG® Airflow monitor (24 V)				**KLSW-W24**	**PLSW-W24**	**KHSSW-W24**
24 V AC / DC		1 changeover contact	–	■ □	■ □	●
RHEASREG® Airflow monitor (230 V)				**KLSW-W230**		**KHSSW-W230**
230 V AC		1 changeover contact	–	■ □	–	●

● = potentiometer (setpoint)
□ = without display
■ = with display

* **AOS** (**Automatic Output Switching**) = patented analogue interface (patent no. DE 10 2015 015 941 B4)
T = **temperature** (0...+50°C) – additional measurand
V = **volume flow** (0...200 000 m³/h) – alternative parameter, can be configured via display!

Everything from a Single Source

S+S stands for a fully integral value chain.

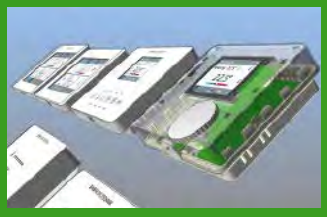
All products are designed, developed, manufactured and programmed in-house. Our new gigafactory in Nuremberg also includes a test centre with climate chambers, measuring benches and calibration facilities for all measurands.

- approx. 85 employees
- 4000 m² of production space, incl. test centre, warehousing and shipping area
- 2000 m² of office space for development, marketing, sales and administration
- 24 hours shipping service
- Made-to-order manufacturing



PROUDLY
MADE IN
GERMANY

S+S REGELTECHNIK



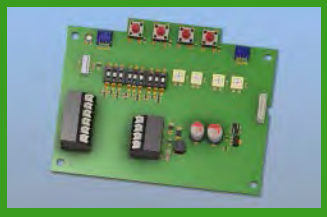
Design



Construction



Toolmaking



Hard- & Software



Test Equipment



Production



Testing



Shipping



S+S Catalogue Items 2024



S+S REGELTECHNIK



ETHERCAT P

Bus-capable sensors
for industrial automation

028 – 057



MODBUS & W-MODBUS

Single-room controllers with touch screen or keys, bus-capable sensors with programmable control

058 – 177



THERMASGARD® & THERMASREG®

Temperature sensors /
temperature transducers,
temperature controllers and thermostats

178 – 367



HYGRASGARD® & HYGRASREG®

Humidity sensors /
humidity transducers,
humidity controllers and hygrostats

368 – 475



PREMASGARD® & PREMASREG®

Pressure sensors /
pressure transducers,
pressure regulators and switches

476 – 543



PHOTASGARD® & KINASGARD®

Light intensity sensors,
motion detectors
and presence detectors

544 – 567



AERASGARD®

Air quality sensors /
air quality transducers for
VOC, CO2 and fine dust

568 – 623



RHEASGARD® & RHEASREG®

Air velocity sensors,
flow monitors and controllers

624 – 635



Immersion sleeves & Accessories

Optional services,
Basic Programme, appendix

636 –675

EtherCAT P

The industrial single-cable solution for communication and power

Industrial automation requires quick and cohesive solutions for real-time communication from control level to field level.

You can also fulfil these increased demands in the sensor technology area with our bus capable measuring transducers for connecting to EtherCAT P.

Application Areas

- Industrial process and plant automation
- Central energy management in the manufacturing industry and in process engineering
- Networked measuring and control of temperature, humidity and pressure parameters in poorly accessible or distant areas



S+S REGELTECHNIK





THERMASGARD®, **HYGR**ASGARD®, **PREM**ASGARD® – ETHERCATP CAPABLE MEASURING TRANSDUCERS

Temperature sensors

ATM 2 - EtherCATP	Outside temperature sensor	**033**
TM 65 - EtherCATP	Duct / immersion / screw-in temperature sensor	**035**
MWTM - EtherCATP	Mean-value temperature sensor	**041**
HFTM - EtherCATP	Sleeve sensor with cable	**043**
ALTM 2 - EtherCATP	Surface-contact temperature sensor	**045**

Moisture and temperature sensors

AFTF - EtherCATP	On-wall humidity and temperature sensor	**049**
KFTF - EtherCATP	Duct humidity and temperature sensor	**053**

Pressure sensors

PREMASGARD® **612x - EtherCATP**	Pressure sensor for differential pressure and volume flow	**057**

Accessories

Special accessories for EtherCATP	**653**
For others see chapter Accessories	**638**





EtherCAT P

THERMASGARD®, **HYGR**ASGARD®, **PREM**ASGARD® – for industrial automation

Ultra-fast industrial bus

Our new EtherCAT P sensors are perfectly tailored for automation without switch cabinets in industrial process, system and facility engineering.
For central energy management and for networked temperature, humidity and pressure control in areas that are difficult to access.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Highlights

- EtherCAT capable
- Can be cascaded in all topologies
- Dual power supply
- Minimal amount of wiring due to M8 connectors
- Fewer fault sources

S+S added value

- Large, three-line display, individually programmable
- Configurable bar graph for displaying the measured value
- Additional configuration facilities, e.g. measurand, filtering, sample time
- Extended sensor data, e.g. retrievable history, maintenance interval determination

Certified quality and tested safety

Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

RoHS conforming materials

ESD compliant manufacturing

CE conformity

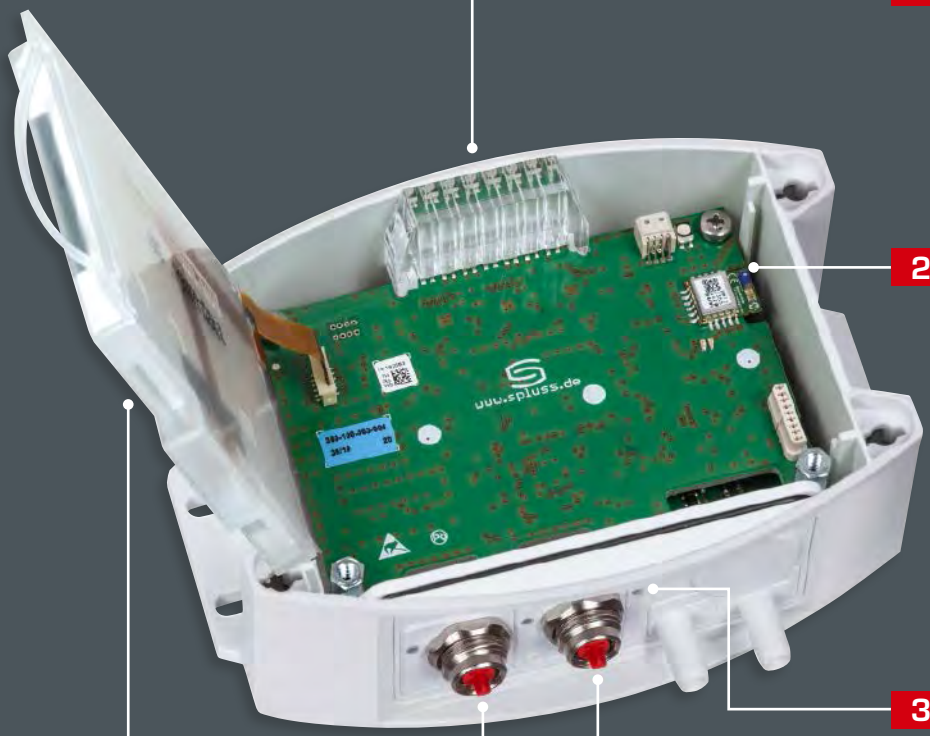
UKCA conformity (UK Conformity Assessed)

EAC certified

GOST certified

PROUDLY MADE IN GERMANY

S+S REGELTECHNIK



1 **Bargraph**

Fibre optics with 7 LEDs, colours, colour change or colour gradient freely configurable, e.g. as traffic light display

2 **Bluetooth**

Module for wireless communication

3 **Status LEDs**

For displaying the three EtherCAT operating statuses IN, OUT and RUN

4 **M8 connectors**

Low wiring effort due to EtherCATP coded built-in connectors

5 **Illuminated display**

Large, three-line display with background lighting, individually programmable



S+S TECHNOLOGY FOR SMART BUILDINGS

THERMASGARD® ATM 2 - EtherCAT P

On-wall / outdoor- / wet room temperature measuring transducers, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable outdoor temperature measuring transducer **THERM**ASGARD® **ATM 2 - EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph.

The on-wall sensor is used to detect the temperature in gaseous media. It is used outdoors or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, the weather and sun protection hood **WS 03** (accessory) is to be used. The sensor is factory-calibrated.

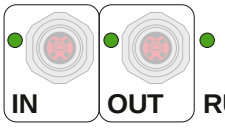
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

ATM 2 - EtherCAT P





EtherCAT P
Cable connection and LED status display



TECHNICAL DATA	
Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150°C
Deviation in temperature:	Typically ± 0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases
Protective tube:	Stainless steel, **V4A** (1.4571), Ø = 6mm (see dimensional drawing)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Ambient temperature:	Measuring transducer –30...+70°C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 54** (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W 51 x H 29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading — **xx-ECATP Tyr 2**



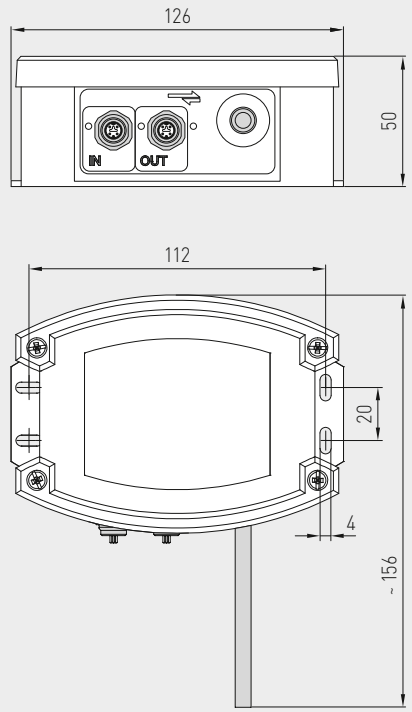
Temperature

Programmable display screen — **xx-ECATP Tyr 2**



Dimensional drawing

ATM2-EtherCAT P





M8-plug-in connector
EtherCATP-encoded

ATM2-EtherCAT P
with display and bar graph





WS-03
Weather and sun protection hood, (optional)





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ATM2-EtherCAT P	On-wall temperature sensor, with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Sensor**	**Output**	**Bar graph Display**	**Item No.**	**Price**
ATM2-ECATP xx						
ATM2-ECATP	–50...+150 °C	Pt1000	EtherCAT P		2001-6201-9100-001	**356,23 €**
ATM2-ECATP **LCD**	–50...+150 °C	Pt1000	EtherCAT P	□■	2001-6202-9100-001	**403,86 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					

ACCESSORIES			
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see last chapter Accessories!		

THERMASGARD® TM65-EtherCAT P

Immersion / screw-in / duct temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable temperature measuring transducer with sensor tube **THERM**ASGARD® **TM65-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph.

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector. The sensor is factory-calibrated.

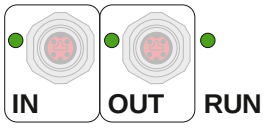
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

TM65-EtherCAT P





EtherCAT P
Cable connection and LED status display



TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150°C
Deviation in temperature:	Typically ±0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Protective tube:	Stainless steel, **V4A** (1.4571), Ø = 6mm, installation length (IL) = 50–400mm (see table)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Ambient temperature:	Measuring transducer –30...+70°C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 54** (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen Reading — **xx-ECATP Tyr 2**



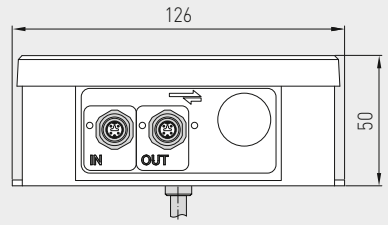
Temperature

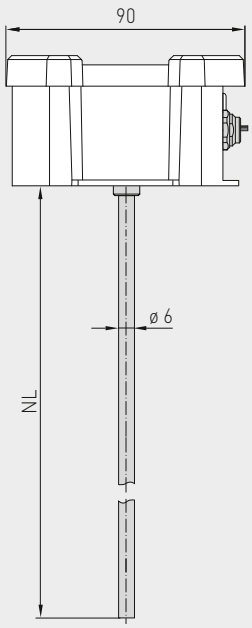
Programmable display screen — **xx-ECATP Tyr 2**

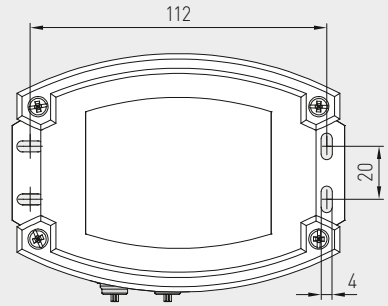


Dimensional drawing

TM65-EtherCAT P









M8-plug-in connector
EtherCATP-encoded



TM65-EtherCAT P
with display and bar graph





High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TM65-EtherCAT P	Temperature measuring transducer (basic unit), with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Output**	**Inserted Length**	**Bar graph Display**	**Item No.**	**Price**
TM65-ECATP xx			**(EL)**			
TM65-ECATP 50mm	–50…+150 °C	EtherCAT P	**50 mm**		2001-4201-9100-011	**352,21 €**
TM65-ECATP 50mm **LCD**				□ ■	2001-4202-9100-011	**399,87 €**
TM65-ECATP 100mm	–50…+150 °C	EtherCAT P	**100 mm**		2001-4201-9100-021	**352,65 €**
TM65-ECATP 100mm **LCD**				□ ■	2001-4202-9100-021	**400,31 €**
TM65-ECATP 150mm	–50…+150 °C	EtherCAT P	**150 mm**		2001-4201-9100-031	**353,13 €**
TM65-ECATP 150mm **LCD**				□ ■	2001-4202-9100-031	**400,76 €**
TM65-ECATP 200mm	–50…+150 °C	EtherCAT P	**200 mm**		2001-4201-9100-041	**353,57 €**
TM65-ECATP 200mm **LCD**				□ ■	2001-4202-9100-041	**401,21 €**
TM65-ECATP 250mm	–50…+150 °C	EtherCAT P	**250 mm**		2001-4201-9100-051	**354,00 €**
TM65-ECATP 250mm **LCD**				□ ■	2001-4202-9100-051	**401,64 €**
TM65-ECATP 300mm	–50…+150 °C	EtherCAT P	**300 mm**		2001-4201-9100-061	**354,45 €**
TM65-ECATP 300mm **LCD**				□ ■	2001-4202-9100-061	**402,09 €**
TM65-ECATP 400mm	–50…+150 °C	EtherCAT P	**400 mm**		2001-4201-9100-081	**354,90 €**
TM65-ECATP 400mm **LCD**				□ ■	2001-4202-9100-081	**402,53 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					

Immersion / screw-in / duct temperature measuring transducer, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

One basic device in four variants ...



TM65-ECATP + TH-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated / galvanised



TM65-ECATP + TH-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM65-ECATP + TH-VA/xx/90

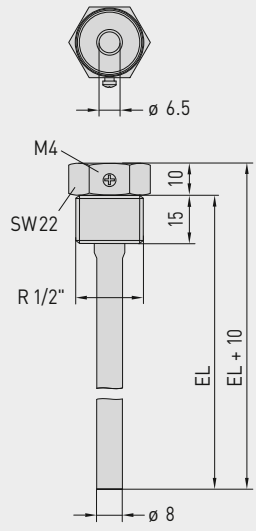
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



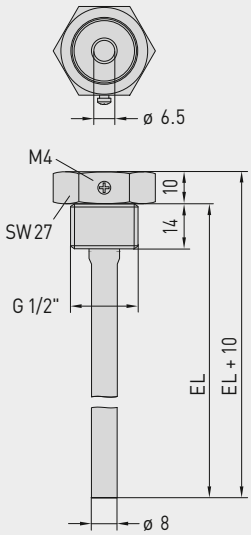
TM65-ECATP + MF-06-K

Duct temperature sensor with mounting flange, plastic

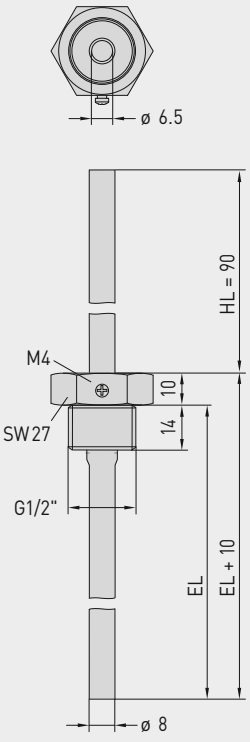
Dimensional drawing
TH-ms/xx



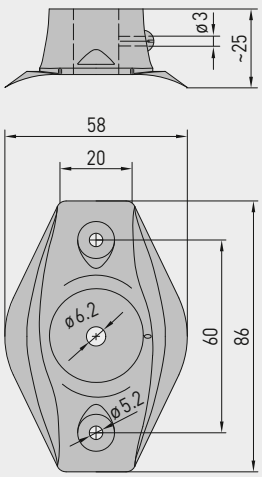
Dimensional drawing
TH-VA/xx



Dimensional drawing
TH-VA/xx/90



Dimensional drawing
MF-06-K



... through combination with accessories:



TH-ms/xx

Immersion sleeve,
brass, nickel-plated / galvanised,
thread-sealing, conical,
according to DIN 10226



TH-VA/xx

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-06-K

Mounting flange,
plastic

THERMASGARD® **TH**	Immersion sleeve Ø 8 mm (Accessories)				
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated / galvanised**			without neck tube	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,59 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,93 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,54 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,91 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,79 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**14,17 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**14,29 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,42 €**
TH-VA/xx	**Stainless steel V4A** (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,89 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**23,08 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,80 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**26,14 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**32,50 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**33,96 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**34,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**34,79 €**
TH-VA/xx/90	**Stainless steel V4A** (1.4571)			**with neck tube** (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,91 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**31,26 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**32,80 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**34,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**35,83 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**38,84 €**
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				

Mounting flange (Accessories)			
Type / WG01		**Item No.**	**Price**
MF xx			
MF-06-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland, T_{max} +100°C	7100-0030-1000-000	**6,30 €**
Note:	For information see last chapter!		

THERMASGARD® MWTM-EtherCAT P

Mean value temperature measuring transducer, incl. mounting flange, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable mean value temperature measuring transducer **THERM**ASGARD® **MWTM-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, with bendable sensor rod (0.4...20m, fully active) in a robust plastic-coated protective copper tube, incl. mounting flange.

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessory) are available. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.



MWTM-EtherCAT P
Rod length
0,4 m

TECHNICAL DATA	
Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C **T_{min} –50 °C, T_{max} +80 °C**
Deviation in temperature:	Typically ±0.2 K at +25 °C
Medium:	Clean air and non-aggressive, non-combustible gases
Sensors:	active across the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated,** with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optionally up to max. 20 m)
Rod laying:	Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N**
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Process connection:	Using plastic mounting flange (included in the delivery scope) and mounting clamps **MK-05-M** (optional accessory)
Ambient temperature:	Measuring transducer –30...+70 °C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 54** (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014/30/EU, according to RED 2014/53/EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table



EtherCAT P
Cable connection and LED status display

Display screen Reading **xx-ECATP Tyr 2**



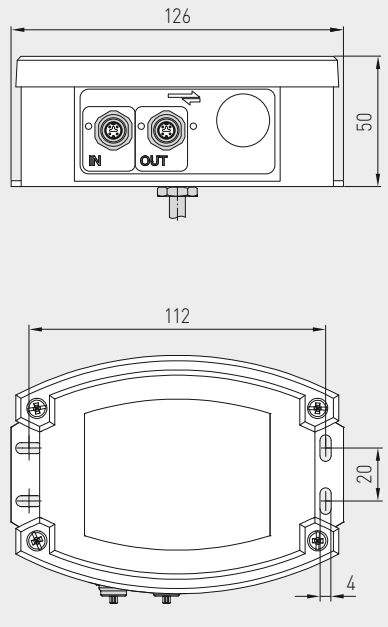
Temperature

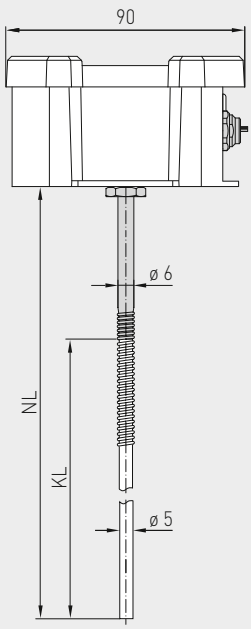
Programmable display screen **xx-ECATP Tyr 2**



Mean value temperature measuring transducer, incl. mounting flange, Bluetooth-enabled, with EtherCATP port

Dimensional drawing **MWTM-EtherCAT P**







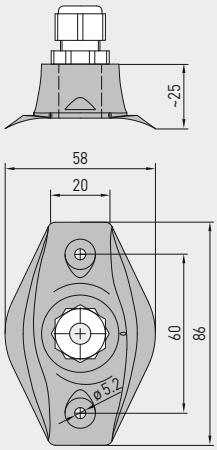
M8-plug-in connector
EtherCATP-encoded

MWTM-EtherCAT P
Rod length
3 m / 6 m

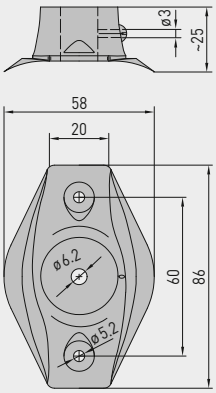




Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



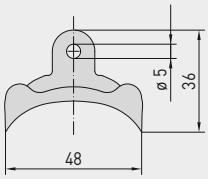
MF-06-K
Mounting flange, plastic
(included in the scope of delivery)



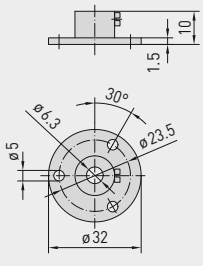
KRD-04
Capillary tube gland bracket, plastic
(optional)



Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**



MF-06-M
Mounting flange, metal
(optional)

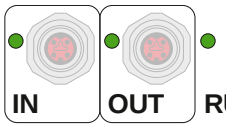


MK-05-M
Galvanised steel mounting clamps
(optional)



**Mean value temperature measuring transducer,
incl. mounting flange, Bluetooth-enabled,
with EtherCATP port**

S+S REGELTECHNIK



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

MWTM-EtherCAT P
with display and bar graph





Mean value temperature measuring transducer, incl. mounting flange, Bluetooth-enabled, with EtherCATP port

MWTM-EtherCAT P
Rod length
3 m / 6 m



MWTM-EtherCAT P
Rod length
0,4 m



THERMASGARD® MWTM-EtherCAT P	Mean value temperature measuring transducer with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Output**	**Rod length**	**Bar graph Display**	**Item No.**	**Price**
MWTM-ECATP xx						
MWTM-ECATP 0,4m	–50…+150 °C	EtherCAT P	**0,4 m**		2001-4211-9100-001	**396,29 €**
MWTM-ECATP 0,4m **LCD**				□ ■	2001-4212-9100-001	**443,94 €**
MWTM-ECATP 3,0m	–50…+150 °C	EtherCAT P	**3,0 m**		2001-4211-9100-011	**431,92 €**
MWTM-ECATP 3,0m **LCD**				□ ■	2001-4212-9100-011	**479,57 €**
MWTM-ECATP 6,0m	–50…+150 °C	EtherCAT P	**6,0 m**		2001-4211-9100-021	**476,45 €**
MWTM-ECATP 6,0m **LCD**				□ ■	2001-4212-9100-021	**524,09 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					

ACCESSORIES			
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,30 €**
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100	**12,95 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**9,18 €**
MK-05-M	Galvanised steel **mounting clamps** (6 pieces)	7100-0034-0000-000	**10,18 €**
	For further information, see last chapter Accessories!		

THERMASGARD® HFTM-EtherCAT P

**Sleeve sensor with temperature measuring transducer,
Bluetooth-enabled,
with EtherCATP port**

S+S REGELTECHNIK

Networkable sleeve temperature measuring transducer **THERM**ASGARD® **HFTM-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, cable sensor with stainless steel sleeve.

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in an immersion sleeve **THE** (accessory), as an immersion and screw-in sensor in liquids. The sensor is factory-calibrated.

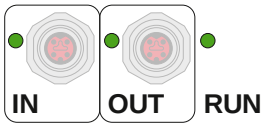
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

HFTM-EtherCAT P





EtherCAT P
Cable connection and
LED status display



TECHNICAL DATA	
Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Measuring range:	–50...+150 °C; T_{max} **up to +150 °C**
Deviation in temperature:	typically ± 0.2 K at +25 °C
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Sensor protection:	sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2 x 0,25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 54** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. 51 x 29 mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.

Display screen
Reading

**xx-ECATP
Tyr 2**



Temperature

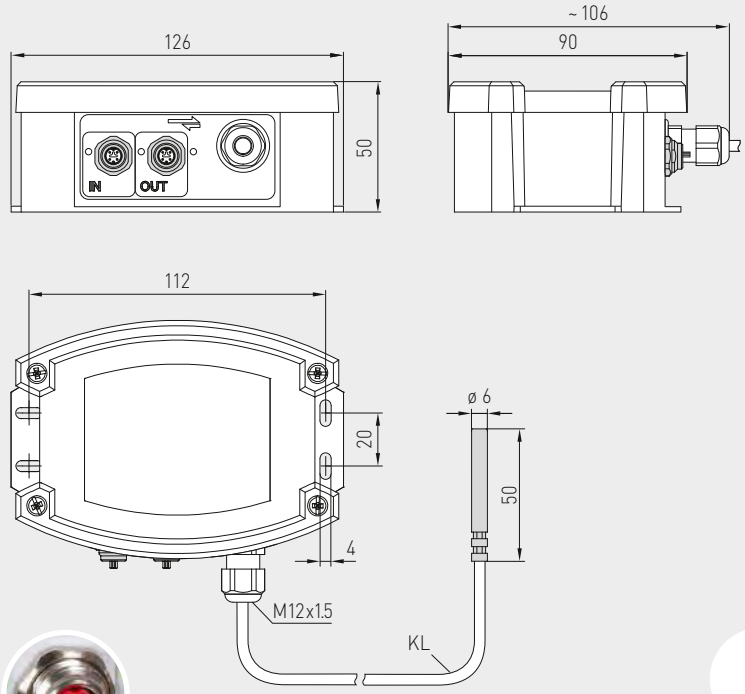
Programmable
display screen

**xx-ECATP
Tyr 2**



Dimensional drawing

HFTM-EtherCAT P



HFTM-EtherCAT P
with display and bar graph





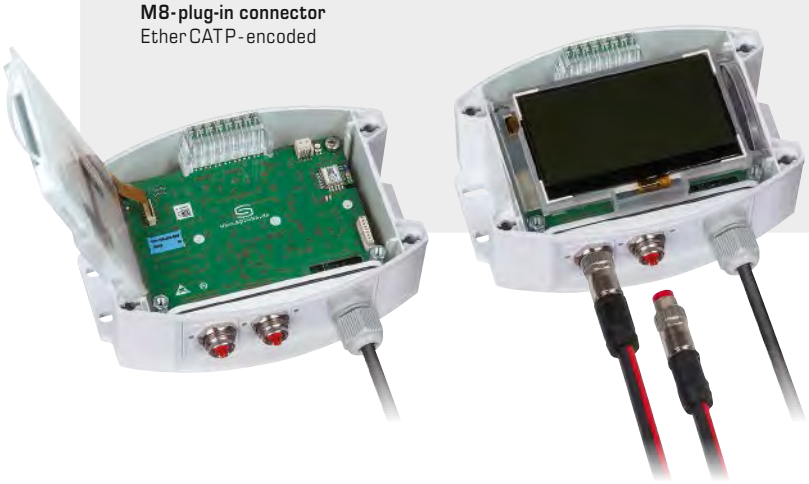
M8-plug-in connector
EtherCATP-encoded



IP65 (standard)
humidity-tight

IP68 (optional)
watertight
Perfect Sensor Protection

IP54 (optional)
with **glass fibre** cable



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® **HFTM-EtherCAT P**	Sleeve sensors with temperature measuring transducer with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Sensor**	**Output**	**Bar graph Display**	**Item No.**	**Price**
HFTM-ECATP xx						
HFTM-ECATP	–50…+150 °C	Pt1000	EtherCAT P		2001-2161-9100-001	**365,14 €**
HFTM-ECATP **LCD**	–50…+150 °C	Pt1000	EtherCAT P	□ ■	2001-2162-9100-001	**412,77 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					
Extra charge:	Protection type **IP68** (sensor sleeve watertight compound-filled)					**3,50 €**
	per running metre of connecting lead (**silicone / PTFE / glass fibre**)				on request	
	other protection sleeve lengths (optional 30…400 mm)				on request	

ACCESSORIES

THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm For further information, see last chapter Accessories!
	For further information, see last chapter Accessories!

THERMASGARD® ALTM2 - EtherCAT P

Surface-contact temperature measuring transducer / pipe surface-contact sensor, with detached sensor, incl. strap, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable surface-contact temperature measuring transducer (detached version) **THERM**ASGARD® **ALTM2 - EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph, cable sensor with pipe feeder, incl. strap.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated.

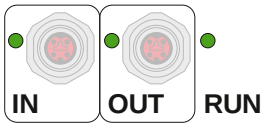
EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

ALTM2 - EtherCAT P





EtherCAT P
Cable connection and LED status display



TECHNICAL DATA	
Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Measuring range:	–50...+150 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	silicone, SiHF, 2 x 0.25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Process connection:	endless strap with metal tightener (included in delivery scope), Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	Measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 54** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table

EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state

The status LEDs are next to the cable connection.

Display screen Reading — **xx-ECATP Tyr 2**



Temperature

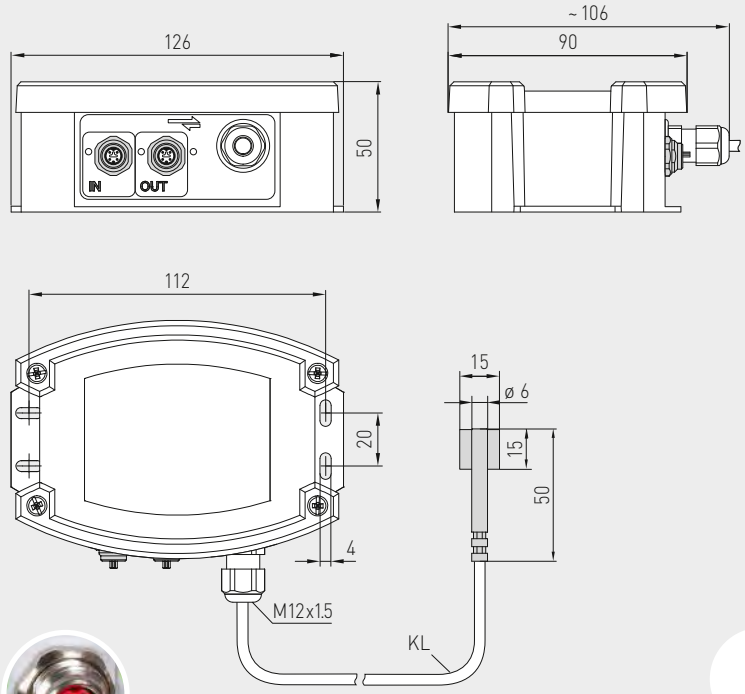
Programmable display screen — **xx-ECATP Tyr 2**



Surface-contact temperature measuring transducer / pipe surface-contact sensor, with detached sensor, incl. strap, Bluetooth-enabled, with EtherCATP port

Dimensional drawing

ALTM2-EtherCAT P



ALTM2-EtherCAT P
with display and bar graph





M8-plug-in connector
EtherCATP-encoded



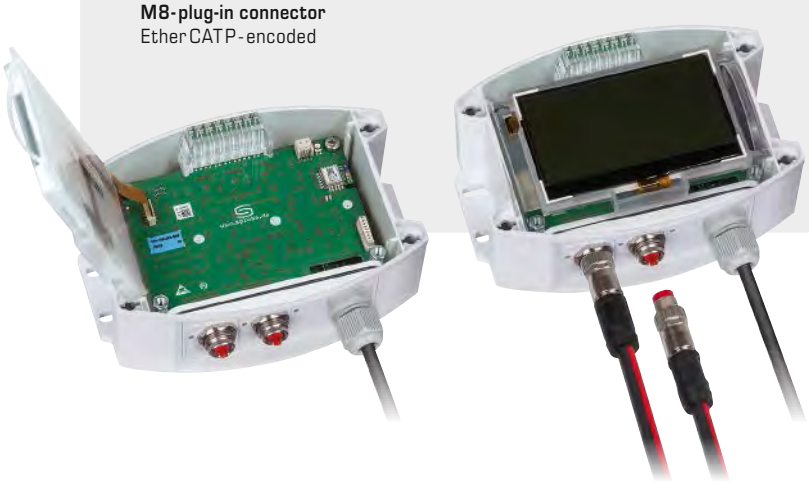
IP65 (standard)
humidity-tight



IP68 (optional)
watertight
Perfect Sensor Protection



IP54 (optional)
with **glass fibre** cable



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® **ALTM2-EtherCAT P**	Surface-contact temperature measuring transducer with detached sensor, with EtherCATP port					
Type / WG02	**Measuring Range** Temperature	**Sensor**	**Output**	**Bar graph Display**	**Item No.**	**Price**
ALTM2-ECATP xx						
ALTM2-ECATP	–50…+150 °C	Pt1000	EtherCAT P		2001-2171-9100-001	**368,41 €**
ALTM2-ECATP **LCD**	–50…+150 °C	Pt1000	EtherCAT P	□ ■	2001-2172-9100-001	**416,07 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)					
Extra charge:	Protection type **IP68** (sensor sleeve watertight compound-filled) per running metre of connecting lead (**silicone / PTFE / glass fibre**)				**on request**	**3,50 €**

ACCESSORIES			
WLP-1	**Heat-conductive paste**, silicone-free	7100-0060-1000-000	**4,79 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® AFTF-EtherCAT P

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable on-wall humidity and temperature sensor **HYGR**ASGARD® **AFTF-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph, with plastic sinter filter (replaceable).

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% RH) and the **temperature** (–35...+80°C) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m³), **mixture ratio** (0...80g/kg), **dew point temperature** (–20...+80°C) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

AFTF-EtherCAT P





EtherCAT P
Cable connection and LED status display

TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Data points:	Temperature [°C], relative humidity [% RH], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity) –35...+80°C (temperature)
Deviation in humidity:	Typically **± 2.0%** (20...80% RH) at +25°C, otherwise ± 3.0%
Deviation in temperature:	Typically ± 0.4K at +25°C
Long-term stability:	± 1% per year
Medium:	Clean air and non-aggressive, non-combustible gases
Sensor protection:	Plastic sinter filter, Ø 14mm, l = 35 mm, replaceable (optionally **metal** sinter filter, Ø 16mm, l = 32mm)
Protective tube:	Stainless steel **V2A** (1.4301), Ø 16mm (see dimensional drawing)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Process connection:	Using screw-in device on housing
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

Display screen Reading — **xx-ECATP Tyr 2**



Humidity



Temperature

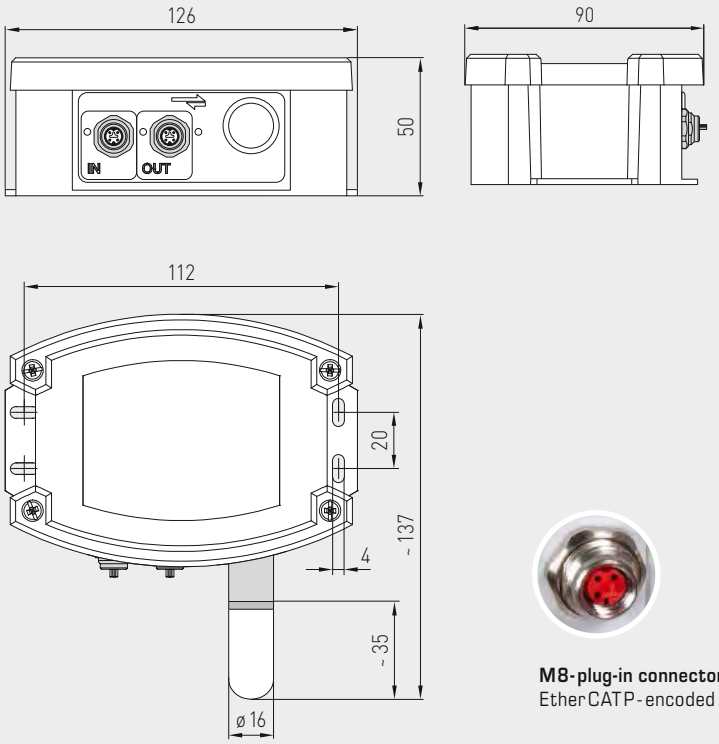
Programmable display screen — **xx-ECATP Tyr 2**



On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCAT P port

Dimensional drawing

AFTF-EtherCAT P



M8-plug-in connector
EtherCAT P-encoded



SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

AFTF-EtherCAT P
with display and bar graph

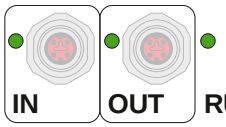




HYGRASGARD® AFTF - EtherCAT P

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

WS-03
Weather and sun protection hood (optional)



Display screen Reading **xx-ECATP Tyr 2**



Humidity



Temperature

Display screen alternative output variables **xx-ECATP Tyr 2**



Absolute humidity



Mixture ratio



Dew point



Enthalpy

Programmable display screen **xx-ECATP Tyr 2**



Use the EtherCAT interface to program the **LCD display**.
With only one output value selected, the display is static;
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the corresponding unit.
The **third line** is empty by default if there are no customised inputs.

The entire display in the 7-segment range
as well as in the dot-matrix range can be **customised**.

On-wall humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

AFTF-EtherCAT P
with display and bar graph







HYGRASGARD® **AFTF-EtherCAT P**	On-wall humidity and temperature sensor (± 2.0%), with EtherCATP port						
Type / WG02	**Measuring Range / Readout** Humidity (switchable)		Temperature	**Output**	**Bar graph Display**	**Item No.**	**Price**
AFTF-ECATP xx							
AFTF-ECATP	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P		2003-6261-9100-001	**378,48 €**
AFTF-ECATP **LCD**	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P	□ ■	2003-6262-9100-001	**426,13 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)						

ACCESSORIES			
WS-03	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000	**13,25 €**
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® KFTF-EtherCAT P

Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable duct humidity and temperature sensor **HYGR**ASGARD® **KFTF-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, with plastic sinter filter (replaceable), incl. mounting flange.

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% RH) and the **temperature** (–35...+80°C) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m³), **mixture ratio** (0...80g/kg), **dew point temperature** (–20...+80°C) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.



KFTF-EtherCAT P

TECHNICAL DATA

Power supply:	24 V DC via EtherCATP (U_S)
Power consumption:	< 3 W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Data points:	temperature [°C], relative humidity [% RH], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity) –35...+80 °C (temperature)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation in temperature:	typically ± 0.4 K at +25 °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	plastic sinter filter, Ø 14mm, l = 35 mm, replaceable (optionally **metal** sinter filter, Ø 16mm, l = 32mm)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (option on request in stainless steel **V2A** (1.4301), Ø 16mm)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 connector**, EtherCATP-encoded
Process connection:	by plastic mounting flange (included in the delivery scope)
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table



EtherCAT P
Cable connection and LED status display

Display screen Reading — **xx-ECATP Tyr 2**



Humidity



Temperature

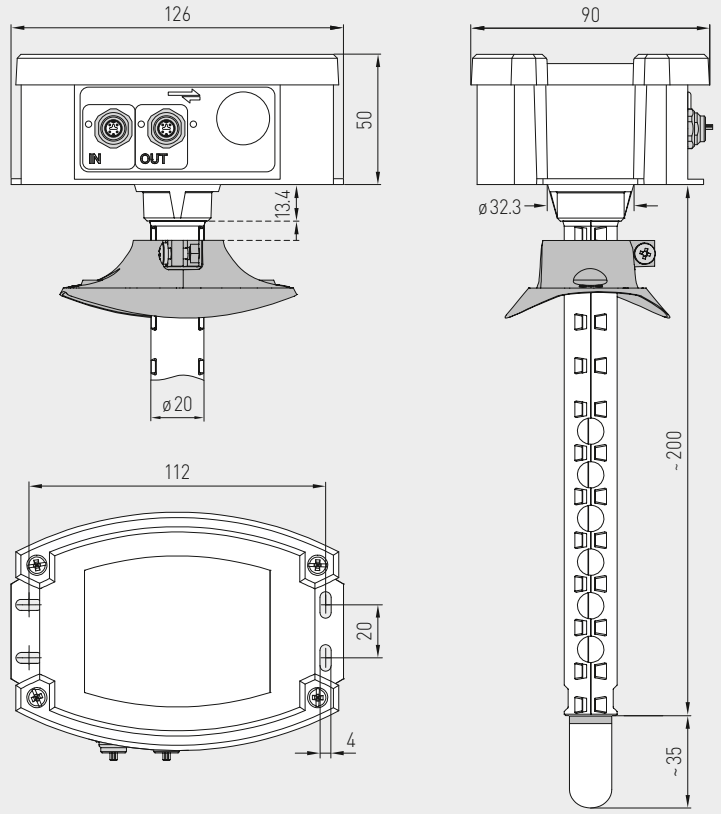
Programmable display screen — **xx-ECATP Tyr 2**



Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCAT P port

Dimensional drawing
[mm]

KFTF-EtherCAT P



KFTF-EtherCAT P
with display and bar graph





M8-plug-in connector
EtherCAT-encoded

SF-K
Plastic sinter filter
(standard)



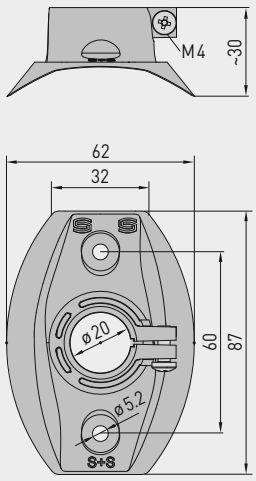
SF-M
Metal sinter filter
(optional)

Protective tube made from stainless steel
(optional on request)



Dimensional drawing
[mm]

MFT-20-K

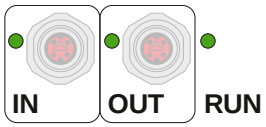


MFT-20-K
Mounting flange,
plastic
(included in the scope
of delivery)



Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK



EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

Display screen
Reading

xx-ECATP
Tyr 2



Humidity



Temperature

Display screen
alternative output variables

xx-ECATP
Tyr 2



Absolute humidity



Mixture ratio



Dew point



Enthalpy

Programmable
display screen

xx-ECATP
Tyr 2



Use the EtherCAT interface to program the **LCD display**.
With only one output value selected, the display is static;
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the corresponding unit. The **third line** is empty by default if there are no customised inputs.

The entire display in the 7-segment range as well as in the dot-matrix range can be **customised**.

Duct humidity and temperature sensor (± 2.0%), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, Bluetooth-enabled, with EtherCATP port

KFTF-EtherCAT P
with display and bar graph



HYGRASGARD® **KFTF-EtherCAT P**	Duct humidity and temperature sensor (± 2.0%), with EtherCATP port						
Type / WG02	**Measuring Range / Readout** Humidity (switchable)		Temperature	**Output**	**Bar graph Display**	**Item No.**	**Price**
KFTF-ECATP xx							
KFTF-ECATP	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P		2003-4221-9100-001	**400,76 €**
KFTF-ECATP **LCD**	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	EtherCAT P	□ ■	2003-4222-9100-001	**448,40 €**
Optional:	shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request	
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)						

ACCESSORIES			
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)	7000-0031-0000-000	**9,85 €**
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000	**13,25 €**
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see last chapter Accessories!		

PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

Networkable pressure measuring transducer **PREM**ASGARD® **612x-EtherCAT P** (series) with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display and bar graph, nozzles for pressure hose (Ø 6 mm), incl. connection kit **ASD-06** (2m connecting hose, two pressure port nipples, screws).

The on-wall sensor is used to measure positive, negative or differential pressure in clean air and gaseous media as well to calculate volume flows using the K-factor with function selection. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated.

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. In case of direct solar irradiation, we recommend using our weather and sun protection hood **WS 03** (accessory).

EtherCATP-enabled measuring transducer for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

PREMASGARD® **612x-ECATP**





EtherCAT P
Cable connection and LED status display

TECHNICAL DATA	
Power supply:	24VDC via EtherCATP (U_S)
Power consumption:	< 3W
Bus protocol:	**EtherCAT**
Radio technology:	**Bluetooth** (LE)
Type of pressure:	Differential pressure (Pa), volume flow (m³/h)
Pressure port:	With nozzles for pressure hose Ø 6mm
Measuring range, pressure:	**–500... +500 Pa** or **–7000...+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 6128** (500 Pa): typically ± 3 Pa at +25°C **type 6127** (7000 Pa): typically ± 35 Pa at +25°C compared to the calibrated reference device
Positive / negative pressure:	max. ± 50 kPa
Medium:	Clean air and non-aggressive, non-combustible gases
Parts in contact with media:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50°C (temperature-compensated 0...+50°C)
Hysteresis:	0.3% of final value
Linearity:	< ± 1% of final value
Temp. drift values:	± 0.1% / °C
Long-term stability:	± 1% per year
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), enclosure cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr 2)
Cable connection:	**M8 plug-in connector**, EtherCATP-encoded
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	**Display with illumination,** 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual pressure or a customised display value. **Bar graph**, 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

Display screen Reading — **xx-ECATP Tyr 2**



Differential pressure



Volume flow rate

Programmable display screen — **xx-ECATP Tyr 2**

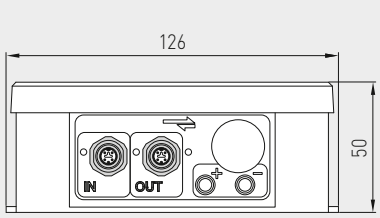


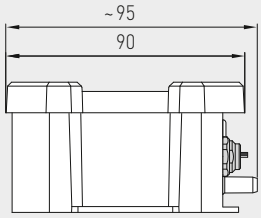
S+S REGELTECHNIK

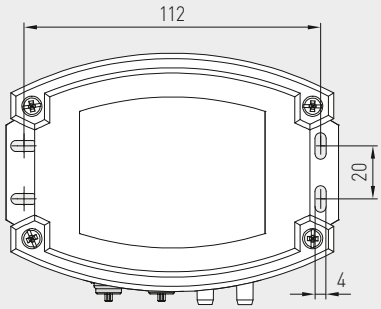
Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

Dimensional drawing

PREMASGARD® **612x-ECATP**









M8-plug-in connector
EtherCATP-encoded

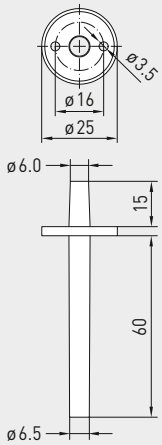
PREMASGARD® **612x-ECATP**
with display and bar graph





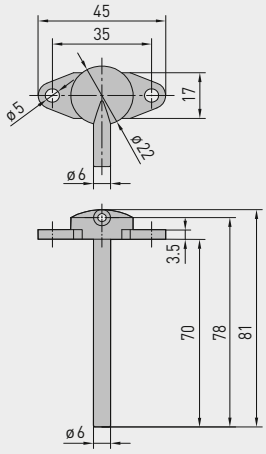
Dimensional drawing

ASD-06
Connection set



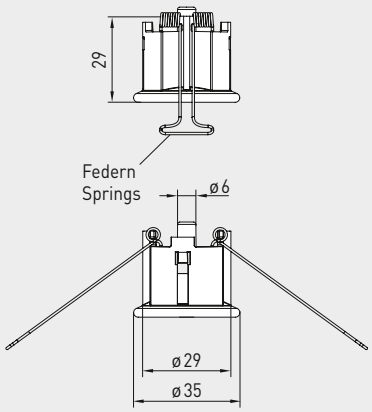
Dimensional drawing

ASD-07
Connection nipple



Dimensional drawing

DAL-01
Pressure outlet



ASD-06
Connection set



ASD-07
Connection nipple



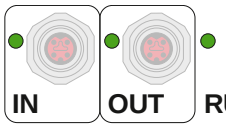
DAL-01
Pressure outlet



PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

S+S REGELTECHNIK

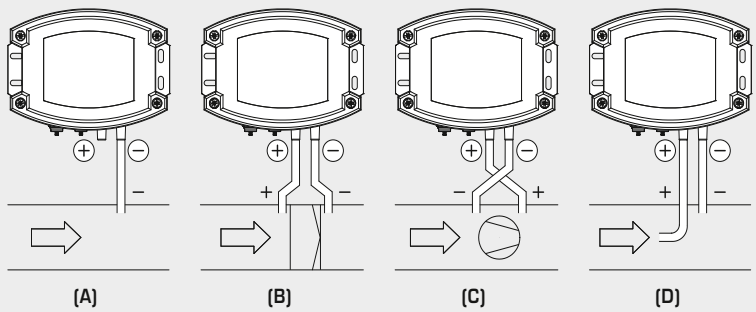


EtherCAT P	LED status display
1. LED	**"IN"**
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	**"OUT"**
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	**"RUN"**
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

WS-03
Weather and sun protection hood, (optional)



Mounting diagram **PREMASGARD® 612x-ECATP**



TYPES OF MONITORING:
The pressure connections are on the housing with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducer for differential pressure and volume flow, incl. connection kit, Bluetooth-enabled, with EtherCATP port

PREMASGARD® **612x-ECATP**
with display and bar graph



PREMASGARD® **612x-EtherCAT P**	Pressure measuring transducer for differential pressure and volume flow, with EtherCATP port				
Type / WG02	**Measuring Range / Readout** Pressure	**Output**	**Bar graph Display**	**Item No.**	**Price**
Type 6128	**–500...+500 Pa**				
PREMASGARD 6128-ECATP	–500...+500 Pa	EtherCAT P		2004-6271-9100-011	**374,03 €**
PREMASGARD 6128-ECATP **LCD**	–500...+500 Pa	EtherCAT P	□ ■	2004-6272-9100-011	**421,68 €**
Type 6127	**–7000...+7000 Pa**				
PREMASGARD 6127-ECATP	–7000...+7000 Pa	EtherCAT P		2004-6271-9100-001	**374,03 €**
PREMASGARD 6127-ECATP **LCD**	–7000...+7000 Pa	EtherCAT P	□ ■	2004-6272-9100-001	**421,68 €**
Note:	Cable connection with **M8 plug-in connector** (EtherCATP-encoded)				

ACCESSORIES

ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90° angle) made of ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see last chapter Accessories!		

Modbus

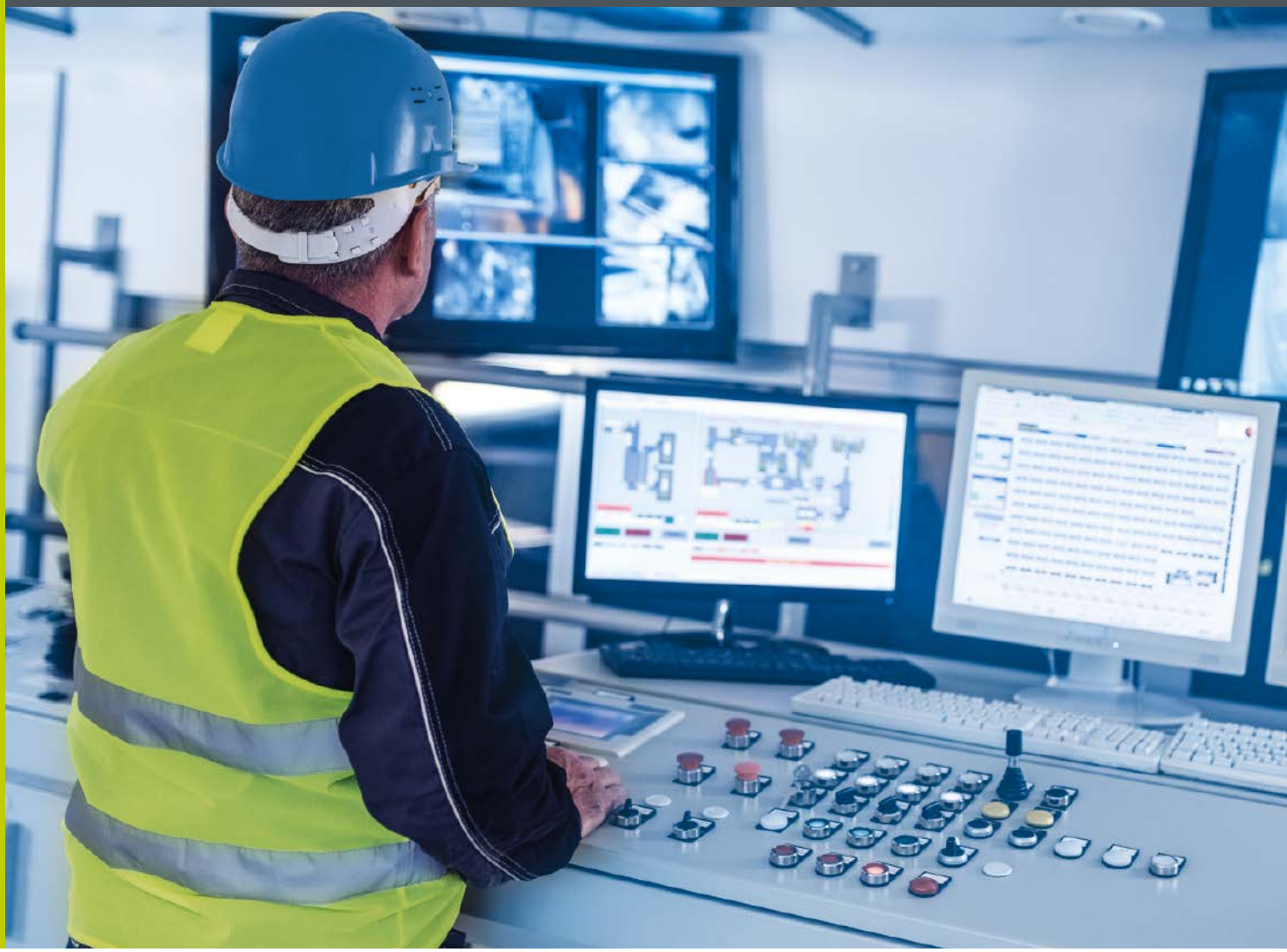
Save Energy with Interconnectivity

Against the background of rapidly increasing energy costs, the centralised measurement, monitoring, and control of power consumption in buildings is also becoming increasingly important.

The interconnection of our bus capable measuring transducers for temperature, humidity, pressure as well as VOC, CO2, particulate matter and air flow leads to comprehensive energy efficiency and thus saves money.

Application Areas

- Building automation in industry and commerce
- Central energy management in public and private facilities, such as hospitals, administrative centres, schools and museums
- Detection and control of temperature, humidity, pressure, air quality and flow in areas which are difficult to access or remote





THERMASGARD®, **HYGR**ASGARD®, **PREM**ASGARD®, **AER**ASGARD® – MODBUS CAPABLE MEASUREMENT TRANSDUCERS

Room control units, Room sensors
Room controller with touch screen / touch keys

RYMASKON® **1000**	Room control units (interface)	NEW	075
RYMASKON® **1000C**	Room controller	NEW	081
RYMASKON® **2000**	Room control units (interface)	NEW	087
RYMASKON® **2000C**	Room controller	NEW	091
RYMASKON® **3000**	Room control units (interface)	NEW	087
RFTF-Modbus-xx	Room control units, on-wall		093
RTM 1-Modbus	Room sensor, on-wall		095
RFTM-CO2-Modbus-P	Room control units, on-wall		155
FSFTM-Modbus **FSFTM-Modbus-P**	Room sensor / Room control units, in-wall		119
FSFTM-CO2-Modbus **FSFTM-CO2-Modbus-P**	Room sensor / Room control units, in-wall		157

Temperature sensors

RTM 1-Modbus	Room temperature sensor	095
RPTM 1-Modbus-T3	Pendulum room temperature sensor	113
RPTM 2-Modbus-T3	Pendulum room temperature sensor	115
HFTM-Modbus-T3	Sleeve sensor with cable	107
ALTM 1-Modbus-T3	Surface-contact temperature sensor	109
ALTM 2-Modbus-T3	Surface-contact temperature sensor with cable	111
ATM 2-Modbus-T3	Outside temperature sensor	097
TM 65-Modbus-T3	Duct / immersion / screw-in sensor	101
MWTM-Modbus-T3	Mean value temperature sensor	105

Special accessories

MODKON® **LA-Modbus**	Line termination device		173
MODKON® **KA2-Modbus**	Communication adapter		175
KYMASGARD® **GW-xx**	W-Modbus gateway	NEW	177
see chapter Accessories			638

Humidity sensors

FSFTM-Modbus	In-wall humidity and temperature sensor	119
RFTF-Modbus	Room humidity and temperature sensor	117
RPFTF-Modbus-T3	Pendulum room humidity and temperature sensor	127
VFTF-Modbus-T3	Showcase humidity and temperature sensor	129
AFTF-Modbus-T3	On-wall humidity and temperature sensor	121
KFTF-Modbus-T3	Duct humidity and temperature sensor	125
TW-Modbus-T3	Dew point sensor	133

Pressure sensors

PREMASGARD® **232x-Modbus-T3**	Pressure measuring transducer	137
PREMASGARD® **714x-Modbus**	Pressure / volume flow measuring transducer	141
PREMASGARD® **724x-Modbus**	Pressure / volume flow measuring transducer (2 channels)	147
PREMASGARD® **814x-Modbus**	Duct humidity and temperature sensor with pressure measuring transducer	151

Air quality sensors
VOC / CO2 / fine dust sensors (PM)

FSFTM-CO2-Modbus	In-wall sensor	157
RFTM-LQ-PS-CO2-Modbus	Room sensor	155
AFTM-LQ-CO2-Modbus	On-wall sensor	161
KFTM-LQ-CO2-Modbus	Duct sensor	165

Multifunctional sensors for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content

Flow sensors

KLGF-Modbus	Duct air flow sensor	NEW	169
KLGFVT-Modbus	Duct sensor for air flow, volume flow and temperature	NEW	169
KHSSFV-Modbus	Duct top-hat rail sensor for airflow and volume flow	NEW	171

Modbus

Modbus capable measuring transducers for multi-functional requirements

Broad Spectrum

Our Modbus-capable temperature, pressure, and humidity sensors are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Each sensor is precisely readjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Highlights

- Galvanic isolation of the RS485 Modbus interface
- Integrated selectable bus termination resistance
- Display with backlighting and freely configurable
- Offset adjustment with potentiometer
- Temperature resolution: 16 bit AD converter, 0.1 K resolution
- Measuring range: –50 to +150 °C
- Accuracy: typically ± 0.2K at+25 °C
- Power supply: 15...36V DC; 24V AC ±20%
- All devices programmable and addressable even when not energized

Certified quality and tested safety

Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

RoHS conforming materials

ESD compliant manufacturing

CE conformity

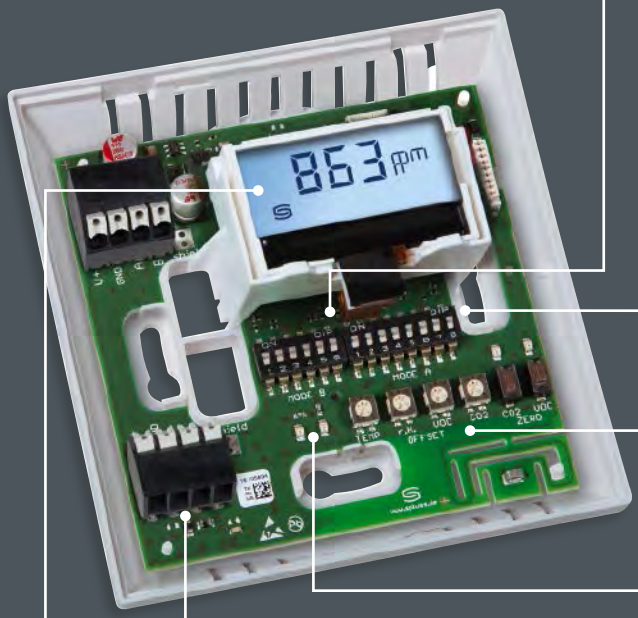
UKCA conformity (UK Conformity Assessed)

EAC certified

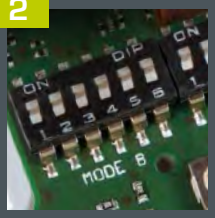
GOST certified

PROUDLY
MADE IN
GERMANY

S+S REGELTECHNIK



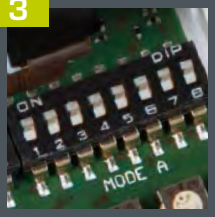
2



DIP Switches für Busparameter

Easy configuration of bus parameters: baud rate, parity, parity check and bus termination

3



DIP Switches for Bus Address

Up to 247 addresses possible, address can be configured even when the device is not energized

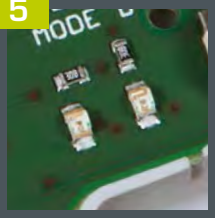
4



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

5



LED for Telegram Indication

(Green for Receive, Red for Error) Permits fast bus communication diagnosis

6



Bus Terminals

Push-in terminals (2x) for I/O

1

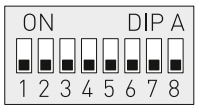


Illuminated Display

With backlighting as well as freely configurable 7/14 segment and 40-point matrix for display of individual measured values

S+S TECHNOLOGY FOR
SMART BUILDINGS

Bus address (DIP A) in binary format



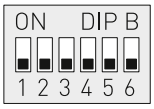
DIP switch [A] for setting the bus address:

Bus address (binary coded, value selectable from 1 to 247)							
DIP 1	**DIP 2**	**DIP 3**	**DIP 4**	**DIP 5**	**DIP 6**	**DIP 7**	**DIP 8**
128	**64**	**32**	**16**	**8**	**4**	**2**	**1**
ON	**ON**	OFF	OFF	OFF	OFF	OFF	**ON**

Example shows
128 + 64 + 1 = 193
as Modbus address.

DIP switch

1		51		101		151		201	
2		52		102		152		202	
3		53		103		153		203	
4		54		104		154		204	
5		55		105		155		205	
6		56		106		156		206	
7		57		107		157		207	
8		58		108		158		208	
9		59		109		159		209	
10		60		110		160		210	
11		61		111		161		211	
12		62		112		162		212	
13		63		113		163		213	
14		64		114		164		214	
15		65		115		165		215	
16		66		116		166		216	
17		67		117		167		217	
18		68		118		168		218	
19		69		119		169		219	
20		70		120		170		220	
21		71		121		171		221	
22		72		122		172		222	
23		73		123		173		223	
24		74		124		174		224	
25		75		125		175		225	
26		76		126		176		226	
27		77		127		177		227	
28		78		128		178		228	
29		79		129		179		229	
30		80		130		180		230	
31		81		131		181		231	
32		82		132		182		232	
33		83		133		183		233	
34		84		134		184		234	
35		85		135		185		235	
36		86		136		186		236	
37		87		137		187		237	
38		88		138		188		238	
39		89		139		189		239	
40		90		140		190		240	
41		91		141		191		241	
42		92		142		192		242	
43		93		143		193		243	
44		94		144		194		244	
45		95		145		195		245	
46		96		146		196		246	
47		97		147		197		247	
48		98		148		198			
49		99		149		199			
50		100		150		200			



DIP switch [B] for setting bus parameters:

Baud rate (selectable)	DIP 1	DIP 2
9600 baud	**ON**	OFF
19200 baud	**ON**	**ON**
38400 baud	OFF	**ON**
Reserved	OFF	OFF

Parity (selectable)	DIP 3
EVEN (numbered)	**ON**
ODD (numbered)	OFF

Parity check (on/off)	DIP 4
Active (1 stop bit)	**ON**
Inactive (no parity) (2 stop bits)	OFF

8N1 mode (on/off)	DIP 5
Active	**ON**
Inactive (default)	OFF

Bus termination (on/off)	DIP 6
Active	**ON**
Inactive	OFF

BUS ADDRESS

The device address in the range of **1 to 247** is set at DIP switch [A].
For switch positions 1 to 8 see the table on the back!

Address 0 is reserved for broadcast messages. Addresses greater than 247 must not be assigned and are ignored by the device.
The DIP switches are binary-coded with the following values:

DIP 1 = **128** ..... DIP 1 = **ON**
DIP 2 = **64** ..... DIP 2 = **ON**
DIP 3 = 32 ..... DIP 3 = OFF
DIP 4 = 16 ..... DIP 4 = OFF
DIP 5 = 8 ..... DIP 5 = OFF
DIP 6 = 4 ..... DIP 6 = OFF
DIP 7 = 2 ..... DIP 7 = OFF
DIP 8 = **1** ..... DIP 8 = **ON**

The switch positions shown here result in the Modbus address **128 + 64 + 1 = 193**

BUS PARAMETERS

The baud rate (speed of transmission) is set at DIP switches 1 and 2 of DIP switch block [B].
Selectable are **9600 baud, 19200 baud**, or **38400 baud** – see table!

Parity is set at DIP switch 3 of DIP switch block [B].
Selectable are **EVEN** or **ODD** – see table!

Parity check is activated via DIP switch 4 of DIP switch block [B].
Selectable are **active (1 stop bit)**, or **inactive (2 stop bits)**, i.e. no parity check – see table!

The **8N1 mode** is activated via DIP switch 5 of DIP switch block [B].
The functionality of DIP switch 3 (parity) and DIP switch 4 (parity check) of DIP switch block [B] is therefore deactivated.
Selectable are 8N1 **active** or **inactive (default)** – see table!.

Bus termination is activated via DIP switch 6 of DIP switch block [B].
Selectable are **active** (bus termination resistance of 120 Ohm), or **inactive** (no bus termination) – see table!

When bus parameters and bus address are changed at devices with **display**,
the respective settings are shown on the display for approx. 30 seconds.

COMMUNICATION INDICATOR

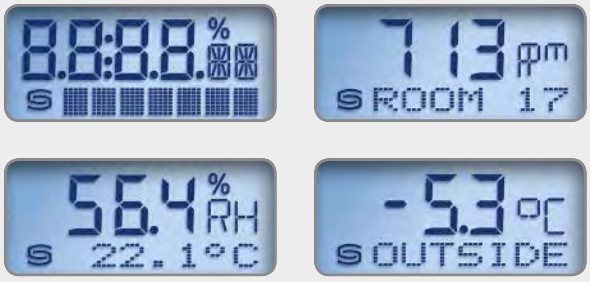
Communication is indicated via two LEDs.
Error-free received telegrams are signalized by the green LED lighting up, regardless of the device address.
Faulty telegrams or triggered Modbus exception telegrams are depicted by the red LED lighting up.

DIAGNOSTICS

An error diagnostic function is integrated.

Display individually programmable via Modbus interface

Display (Baldur)
Symbols and display examples



Alternative parameters
Display programmable via index



Display (Tyr 2)
Symbols and display examples



Individually programmable display area for two or three-line displays

Our displays can be controlled via the Modbus interface.
This means that messages such as those from the PLC can also be displayed.

All characters in the display can be individually described both in the 7-segment area, and in the dot matrix area.

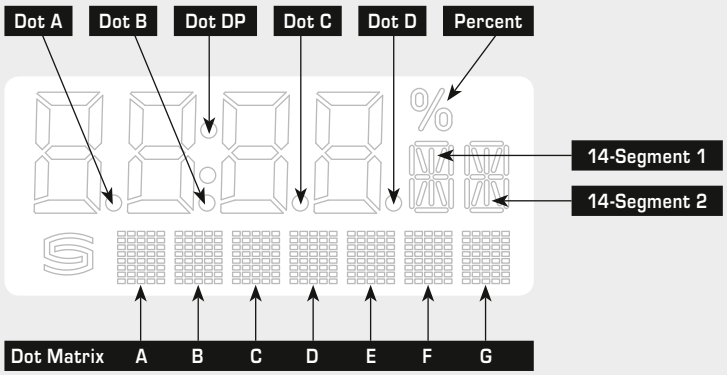
Depending on the device type, it is also possible to display alternative parameters such as absolute humidity, dew point, mixture ratio or enthalpy instead of the standard display.

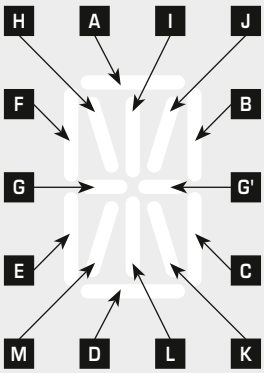
Display (Tyr 3)
Symbols and display examples



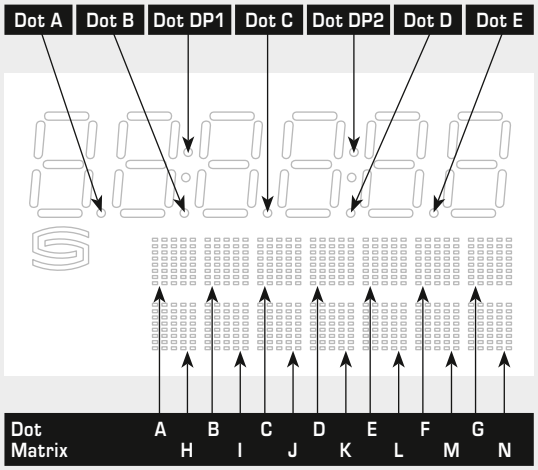
Composition of segment patterns

Display (Baldur)
two-line, cut-out approx. 36 x 15 mm

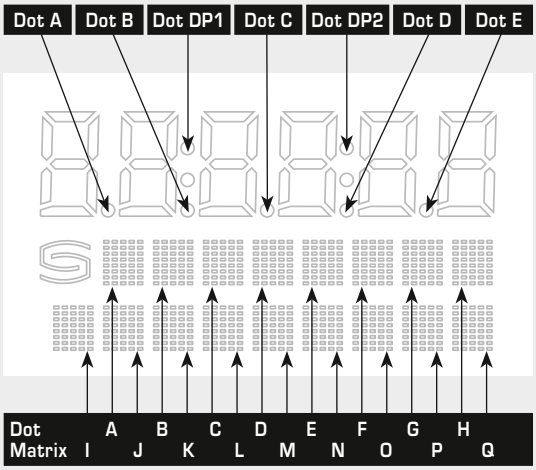




Display (Tyr 2)
three-line, cut-out approx. 70 x 40 mm



Display (Tyr 3)
three-line, cut-out approx. 51 x 29 mm



Representable characters in the dot matrix display area for two- and three-line displays

ASCII characters or control characters are displayed as spaces.

ASCII	Sign
32	Blank
33	!
34	“
35	#
36	$
37	%
38	&
40	(
41	)
42	*
43	+
44	,
45	-
46	.
47	/

ASCII	Sign
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9
58	:
59	;
60	<
61	=
62	>

ASCII	Sign
63	?
64	@
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M

ASCII	Sign
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z
91	[
93	]

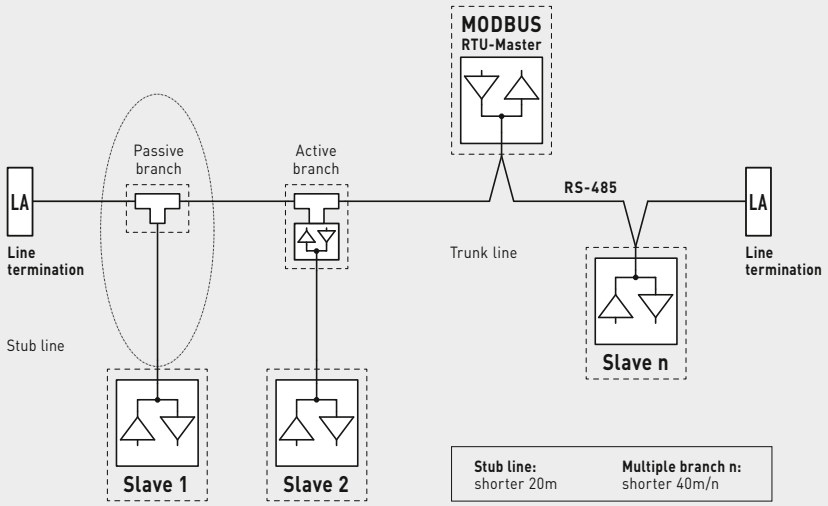
ASCII	Sign
94	^
95	_
96	\
97	a
98	b
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l

ASCII	Sign
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z
123	{

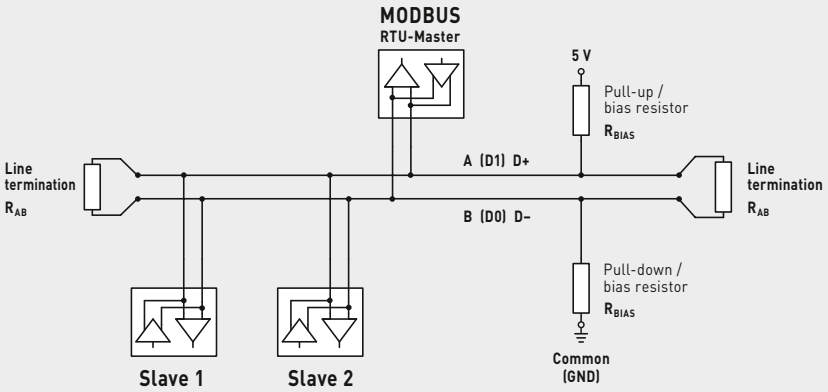
ASCII	Sign
124	|
125	}
129	ü
132	ä
142	Ä
148	ö
153	Ö
154	Ü
223	°

General layout of bus structure and bus topology with terminating and bias resistors

General layout of bus structure



Bus topology with terminating and bias resistors

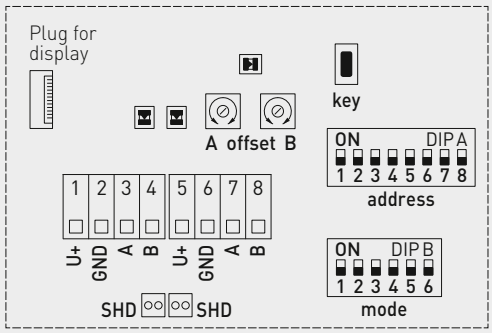


Terminating resistor may only be installed at the ends of the bus line.
In networks with repeaters not more than two line terminations are allowed.
Line termination at the device can be activated via DIP switch 6.
The bias resistors for bus level definition in the resting state are usually activated at the Modbus master / repeater.

The maximum number of subscribers per Modbus segment is 32 devices.
When the number of subscribers is greater, the bus must be subdivided into several segments separated by repeaters. The subscriber address can be set from 1 to 247.

For the bus line, a twisted-pair cable data line / power supply line and copper mesh wire shield must be used. Therefore, the line capacitance should be less than 100 pF/m (e.g. Profibus cable).

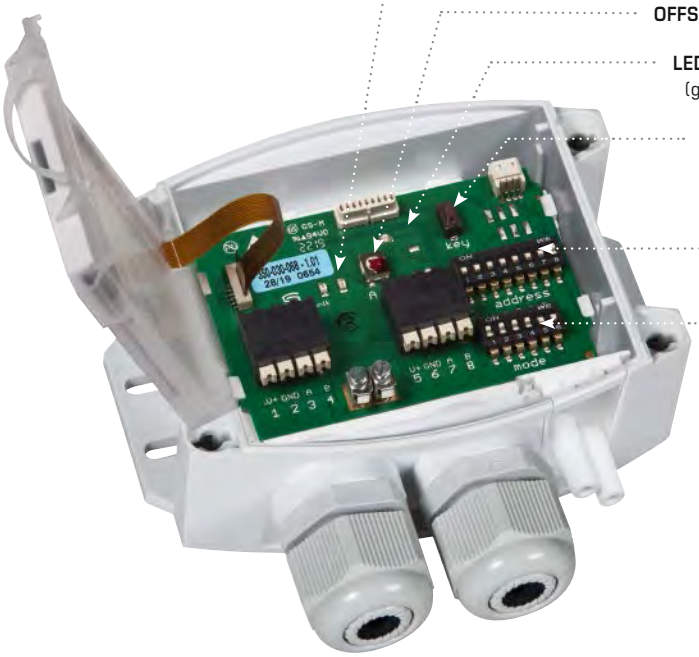
Sensors (Tyr3) — **Modbus** (RTU cable)



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W / 24 V DC; < 1.6 VA / 24 V AC
Electrical connection:	see schematic diagram 0.2 - 1.5 mm², via push-in terminals
Bus parameters:	**without power supply** (in powerless mode) **configurable and addressable** via DIP switch!
Bus interface:	RS 485, **galvanically isolated,** Bus termination activatable via DIP switches. Up to 32 devices possible in one segment. In case of a greater number of devices, RS485 transceivers must be used.
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Status indicator:	LED green = Telegram valid LED red = Telegram error
Display:	The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.



2 separate **plug terminals** (push-in terminals)

OFFSET correction

LED for telegram indication (green for reception , red for error)

Push-button for manual zero point calibration

DIP switches block A for bus address

DIP switches block B for bus parameters



Foldable **display** (optional), Individually programmable display

2 separate **cable glands** (M20) with seal and strain relief

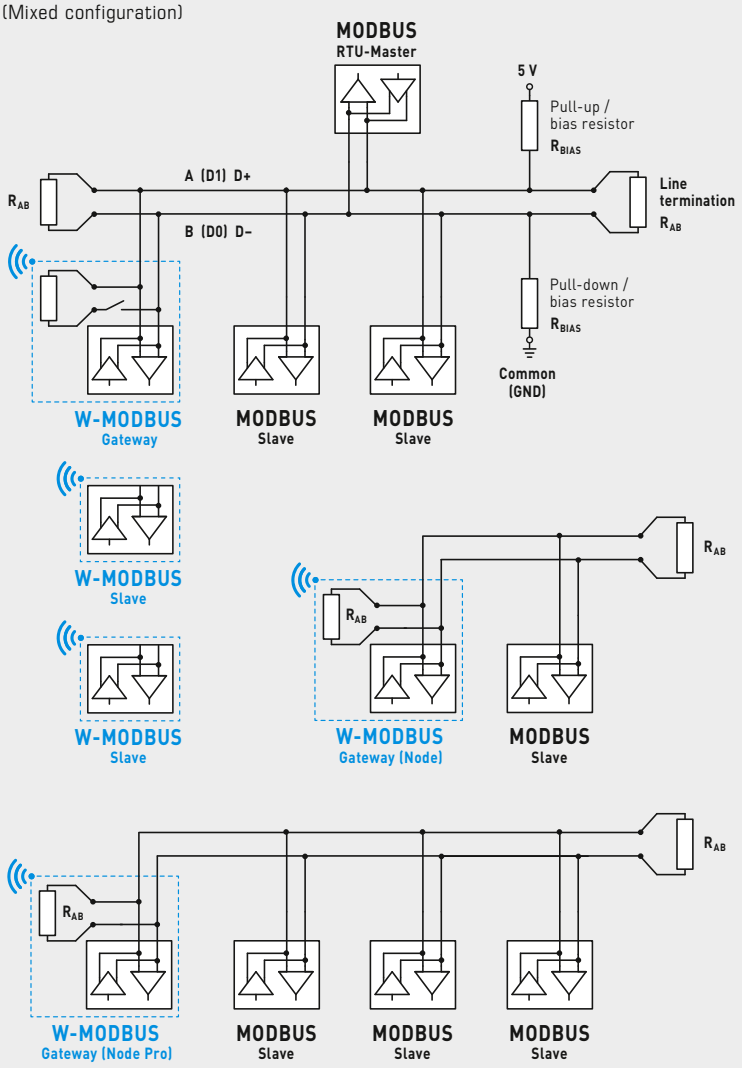
W-Modbus

**General bus topology structure
with terminating and bias resistors
(mixed configuration with W-Modbus gateway)**

NEW

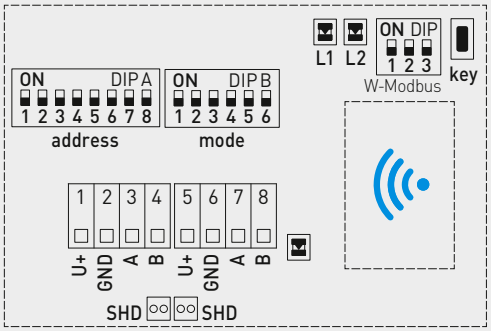
S+S REGELTECHNIK

Bus topology with terminating and bias resistors
(Mixed configuration)



Gateway
(Tyr3)

GW-wModbus
(Wireless)



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)

DIP W-Modbus:
Operating mode (Gateway, Node...)

SHD Shielding

Telegram indicator

Teach-in key
key

L1 Network Status
L2 Connection quality

**Various functions
of the W-Modbus gateway:**

Gateway operation for connection to an existing Modbus topology or directly to a DDC, serves as a base station for W-Modbus sensors (max. 100 radio nodes).

Node operation enables the radio-based connection of a wired Modbus sensor to a W-Modbus network (max. 1 wired sensor).

Node Pro operation (extended node operation) serves for the radio-based connection of multiple wired Modbus sensors (max. 16 wired nodes).

The **W-Modbus protocol** is based on the (2.4 GHz ISM radio band) and employs a patented frequency hopping technology to maximise reliability and resistance to interference. This means that reliable radio transmission can also be ensured in industrial environments.

In the **W-Modbus network** up to 100 nodes can communicate with each other over a long distance of up to 500 metres (open field) using one gateway.
A standardised W-Modbus module ensures compatibility with all W-Modbus units.

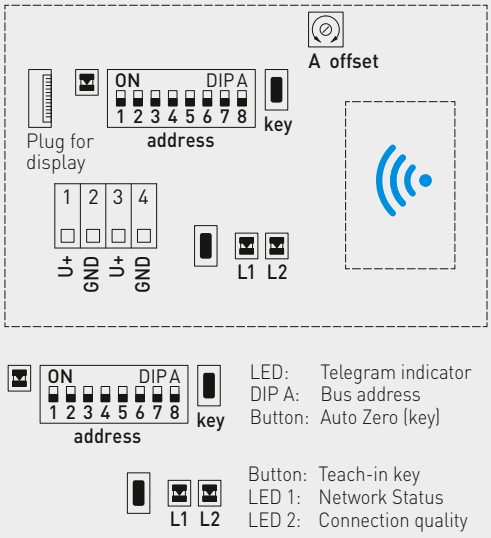
The **W-Modbus sensors** only need to be supplied with power.
Only the slave address is configured manually, the transmission parameters (baud rate and parity) are set automatically. No terminating resistor is required. The sensor is then paired with a gateway.

The **W-Modbus gateway** serves as a transition between wired Modbus and radio-based W-Modbus. Even mixed configurations of wired and radio-based Modbus units can be easily integrated into existing network topologies via the W-Modbus gateway.



Sensors
(Tyr3)

W-Modbus
(Wireless)



TECHNICAL DATA

Power supply:	24 VAC (± 20 %); 15…36 VDC
Power consumption:	< 2 W / 24 VDC; < 3.5 VA / 24 VAC
Electrical connection:	see schematic diagram 0.2 - 1.5 mm², via push-in terminal
Bus address:	**without power supply** (in powerless mode) **configurable and addressable** via DIP switch!
Bus parameters:	automatic configuration
Communication:	**W-Modbus** (Wireless Modbus)
Range:	max. 500 metres (open field) between two radio nodes
Nodes:	max. 100 radio nodes
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Status indicator:	Telegram indication, network status, connection quality
Display:	The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.



Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or W-Modbus (Wireless)

The room control units of the **RYM**ASKON® **1000** / **2000** / **3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The **RYM**ASKON® **1000** room control units (interface) are used for controlling temperature, fans, sun protection (Venetian blinds, shutters) or light. The room control units make the setpoints available to the BMS either via conventionally wired Modbus or via the wireless, radio-based W-Modbus. The optical display is a 2" TFT **display** (**LEDs** on request), operation is via capacitive **touch keys**.

In addition to the integrated temperature and humidity sensor, **sensors** for CO2 and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example.
This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are optionally available in the contemporary **housing** Iduna 1 (93 x 83 mm) and Iduna 3 (111 x 89 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes (or on-wall in the Iduna housing 3, on request).

TECHNICAL DATA

Unit type:	Room control units (interface)
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed in the Modbus register)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [pbb], carbon dioxide (CO2) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; typically < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	**Modbus RTU** Slave, address range 1...247, RS 485 interface, max. 63 units, 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or **W-Modbus** (Wireless) Slave, address range 1...247, approx. 63 units, BMS connection is radio-based via W-Modbus gateway
Display:	**TFT display**, 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85° or **LEDs** (on request)
Operating elements:	**Capacitive keys** (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 NTC10K (configurable as a digital input) 1 digital input for potential-free switches
Outputs:	**Modbus** / **W-Modbus** or (on request) 5 analogue outputs (0-10 V) for target temperature, fan stages, presence message, sensor values, digital output
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Housing:	Plastic, ABS material, colour white or black
Housing dimensions:	93 x 83 x 24 mm (Iduna 1) + 22 mm (in-wall) 111 x 89 x 24 mm (Iduna 3) + 22 mm (in-wall) (without in-wall on request)
Mounting:	Wall-mounting on in-wall flush box, Ø 55 mm, (on-wall installation on request)
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity, 2014/30/EU EMC Directive (EN 60730-1/2, EN 61000-6-1/3), 2001/95/EG Product safety (EN 60730-1) Radio Directive ETSI 300 328 V2.2.2

Continued on next page!

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or W-Modbus (Wireless)

TECHNICAL DATA	(continuation)
TEMPERATURE	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.5 K at +25 °C
HUMIDITY	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	(optional)
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C
AIR QUALITY (VOC)	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to 0...30 000 ppb ethanol equiv.)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

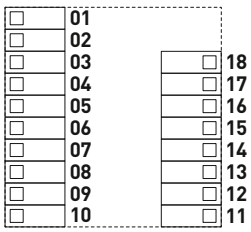
Standard design
with display and touch keys
e.g. **type 1201-LB**



Optional design
with LEDs and touch keys
(on request)
e.g. **type 1201-LB-LED**



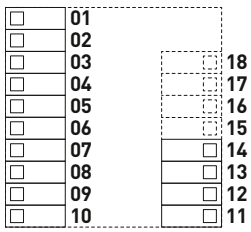
RYMASKON **1000-MOD** Interface



01 free
02 free
03 free
04 free
05 free
06 free
07 free
08 free
09 GND (DI2)
10 **DI2**

11 **UB+** 24V AC/DC
12 **UB–** GND AC/DC
13 **NTC10K** (**DI1**, potential-free)
14 GND (NTC10K/DI1)
15 Modbus A
16 Modbus B
17 Modbus A
18 Modbus B

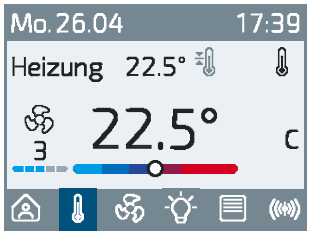
RYMASKON **1000-WMOD** Interface

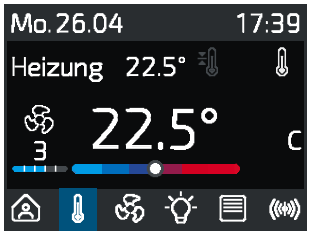


01 free
02 free
03 free
04 free
05 free
06 free
07 free
08 free
09 GND (DI2)
10 **DI2**

11 **UB+** 24V AC/DC
12 **UB–** GND AC/DC
13 **NTC10K** (**DI1**, potential-free)
14 GND (NTC10K/DI1)
15 free
16 free
17 free
18 free

Display symbols





Modbus
W-Modbus

S+S REGELTECHNIK

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or W-Modbus (Wireless)

Basic models
(see type table)
Iduna 1

Type 1101



Type 1102



Type 1201



Type 1202



Basic models
(see type table)
Iduna 3

Type 1301



Type 1302



Type 1401



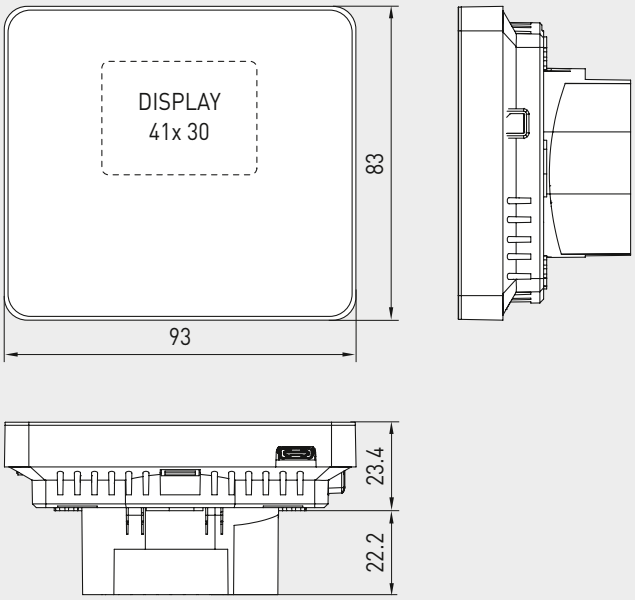
Type 1402



Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or W-Modbus (Wireless)

Dimensional drawing **Iduna 1**
[mm]

RYMASKON® **11xx**
RYMASKON® **12xx**



Optional designs
with 2 keys – sun protection
Type 1201-BB

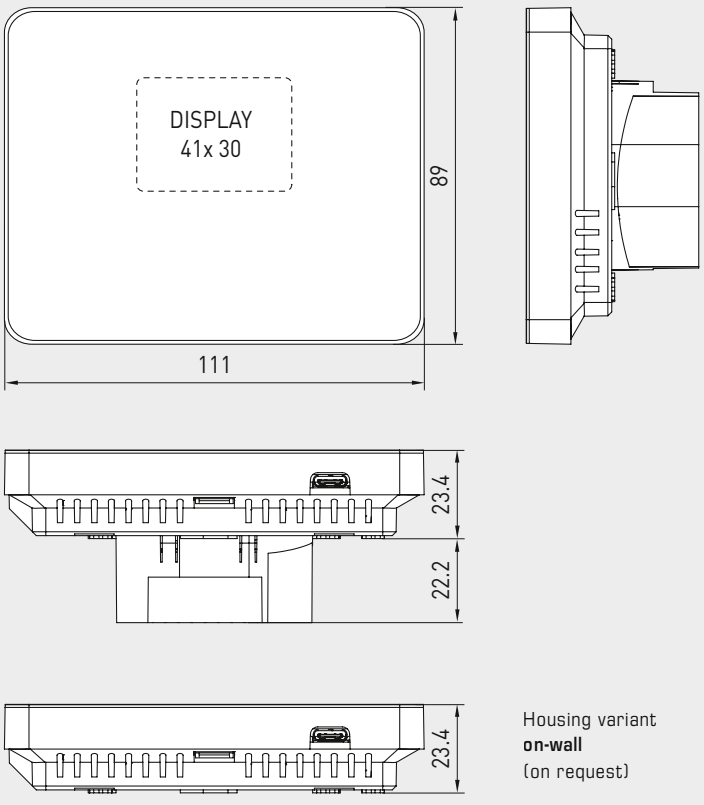


Type 1201-LED-BB



Dimensional drawing **Iduna 3**
[mm]

RYMASKON® **13xx**
RYMASKON® **14xx**



Housing variant
on-wall
(on request)

Type 1401-BB



Type 1401-LED-BB

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or W-Modbus (Wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

RYMASKON® 1000 Interface (series)
Number key for type versions

R	Y	M	1	-	x	0	x	x	-	x	x	1	x	-	0	x	x

Pos. 1-4 **Type name**

RYMASKON 1000	RYM1

Pos. 5 Housing | **setpoint adjustment**

Iduna 1 | Temperature	1
Iduna 1 | Temperature + fan	2
Iduna 3 | Temperature	3
Iduna 3 | Temperature + fan	4

Pos. 6 **Unit type**

Interface	0

Pos. 7 **Housing colour**

White	1
Black	2

Pos. 8 **Visual indication**

TFT display (2.0")	1
LEDs (on request)	2

Pos. 9 **Communication / output**

Modbus		M
W-Modbus (only Iduna 3)	*1	W
active (0-10 V) (on request)		U

Pos. 10 **Sensors**

T [°C/°F]		1
T [°C/°F], **RH** [%]	*1	2
T [°C/°F], **CO2** [ppm]	*1	3
T [°C/°F], **VOC** [%]	*1	4
T [°C/°F], **CO2** [ppm], **VOC** [%]	*1	5
T [°C/°F], **RH** [%], **CO2** [ppm]	*1	6
T [°C/°F], **RH** [%], **VOC** [%]	*1	7
T [°C/°F], **RH** [%], **CO2** [ppm], **VOC** [%]	*1	8

Pos. 11 **Voltage supply**

24 V AC/DC	1

Pos. 12 **Mounting**

on in-wall flush box, Ø 55 mm		0
on-wall (only Iduna 3)	*1	1

Pos. 14-15 **Touch key extension** *2

Basic model (cf. **Pos. 5**) including room occupancy	00
+ **B** (1 sun protection)	01
+ **BB** (2 sun protection)	02
+ **L** (1 light)	03
+ **LL** (2 light)	04
+ **LB** (1 light, 1 sun protection)	05

*1 Design only possible in combination with housing Iduna 3 (cf. **Pos. 5**)

*2 Sun protection adjustment (**B**) and light (L) only via bus

Sensors
T Temperature [°C/°F]
RH Relative humidity [%]
CO2 Carbon dioxide [ppm]
VOC Air quality [%]

Interface for control of temperature, fan, light and sun protection
Room control panel with colour TFT display,
with Modbus connection or W-Modbus (Wireless)

KEY FEATURES

Basic models (see type table)

- 24 V AC/DC voltage supply
- **Modbus** connection or wireless **W-Modbus**
- 2.0" TFT **display** (320 x 240 x 3 RGB pixels), with LED backlighting, high contrast, 85° viewing angle, (LED display on request)
- Capacitive **touch keys** (optional extension to max. 10 keys)
- optional **housing** Iduna 1 (93 x 83 mm) and Iduna 3 (111 x 89 mm), white and black colours, for wall-mounting on in-wall flush boxes (on-wall on request), quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment) (CO2 and VOC sensors available as an option)
- **Regulation** of heating, cooling, fan via Modbus/W-Modbus
- **Control** of temperature, fan (sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features** such as automatic brightness adjustment, stand-by, wake-up, etc.

Type 1301



Type 1402



RYMASKON® 130x — Interface (basic model)
Room control units for temperature adjustment

Type / WG02	Communication	Measuring element	Control system	Colour / Housing	Display	Item no.	Price
RYMASKON® **130x** MOD				**Iduna 3**			
RYM 1301-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3011-M210-000	**211,65 €**
RYM 1302-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3021-M210-000	**211,65 €**
RYMASKON® **130x WMOD**				**Iduna 3**			
RYM 1301-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3011-**W**210-000	**291,65 €**
RYM 1302-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3021-**W**210-000	**291,65 €**

RYMASKON® 140x — Interface (basic models)
Room control units for temperature and fan adjustment

Type / WG02	Communication	Measuring element	Control system	Colour / Housing	Display	Item no.	Price
RYMASKON® **140x** MOD				**Iduna 3**			
RYM 1401-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4011-M210-000	**211,65 €**
RYM 1402-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4021-M210-000	**211,65 €**
RYMASKON® **140x WMOD**				**Iduna 3**			
RYM 1401-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4011-**W**210-000	**291,65 €**
RYM 1402-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4021-**W**210-000	**291,65 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor		**T** = Temperature **F** = Fan **R** = Room occupancy				

OPTIONS

Measuring elements:	**CO2** = CO2 sensor	Extra charge	**123,60 €**
	VOC = VOC sensor	Extra charge	**120,51 €**
Control:	**B** / **L** Keys for sun protection and/or light (cf. **Pos. 14-15**)	on request	
Communication:	without Modbus	on request	
Optional:	**More type versions available upon request!** For configuration options, see number key (left)		

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or wireless W-Modbus

The room control units of the **RYM**ASKON® **1000** / **2000** / **3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYM**ASKON® **1000 C** (controller) are used to control and regulate heating convectors and fan coils. Depending on the type variant, the units are available with analogue outputs (0-10 V) and with Digital/relay outputs for controlling heating valves, cooling valves, 6-way valves, staged fans or EC fans. Control takes place via PI, PWM or 2-point/3-point control. The change-over function can be used to operate 2-pipe and 4-pipe systems. The Modbus or W-Modbus communication interface enables the climate parameters on the controller to be changed and monitored via the BMS at any time. In addition, the sun protection (Venetian blinds, shutters) and light functions can be controlled via the bus. Visual indication takes place on a 2" TFT **display**, operation is via capacitive **touch keys**.

In addition to the integrated temperature and humidity sensor, **sensors** for CO2 and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example.
This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 3 (111 x 89 mm) in white or black colour.
Wall-mounting is performed on standard in-wall flush boxes.

TECHNICAL DATA

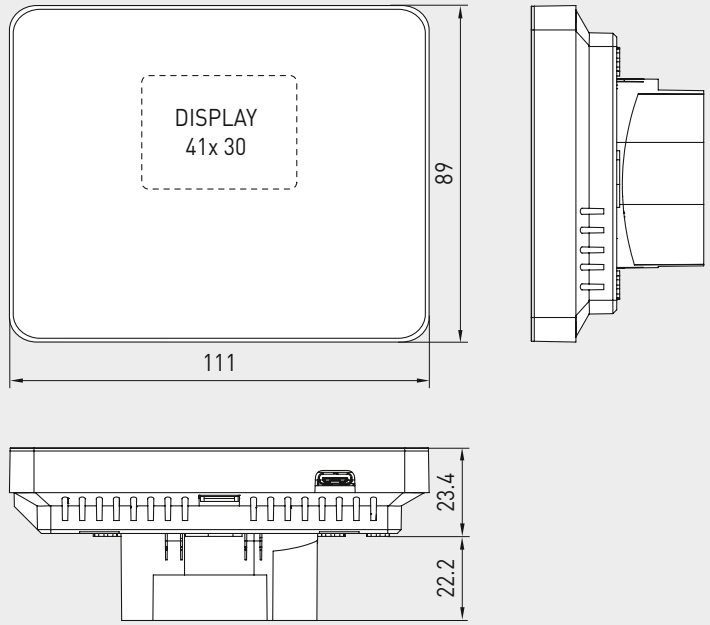
Unit type:	Room controller for heating convectors or fan coils
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed in the Modbus register)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [ppb], carbon dioxide (CO2) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; typically < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %) or 230 V AC (100-240 V AC)
Communication:	**Modbus RTU** Slave, address range 1...247, RS 485 interface, max. 63 units, 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or **W-Modbus** Slave, address range 1...247, approx. 63 units, BMS connection is radio-based via W-Modbus gateway
Display:	**TFT display**, 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	**Capacitive keys** (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 Input **NTC10K** (can be configured as a digital input **DI 1**, potential-free) 1 Digital input **DI 2** for potential-free switches or for potential-loaded switch (230 V AC relay variant)
Outputs:	Analogue outputs **AO** (0-10 V DC, max. 5 mA) as **PI controllers** relay outputs **RO** (230 V AC, max. 500 mA, cos φ = 1.0) or relay outputs **RO** (230 VAC, max. 3 A, cos φ = 1.0) as **2-point/3-point controllers** Digital outputs **DO** (I_n 400 mA, short circuit max. 1.2 A) as **2-point/3-point controllers**, **PWM** for heating/cooling, 6-way-valves, fan, number depends on controller type (see connection diagrams)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Housing:	Plastic, ABS material, colour white or black
Housing dimensions:	111 x 89 x 24 mm (Iduna 3) + 22 mm (in-wall)
Mounting:	Wall-mounting on in-wall flush box, Ø 55 mm, (on-wall installation on request)
Ambient temperature:	0...+50 °C (operation); –30...+70 °C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, 2014/30/EU EMC Directive (EN 60730-1/2, EN 61000-6-1/3), 2001/95/EG Product safety (EN 60730-1), 2014/35/EU Low-Voltage Directive (EN 60730-1/2) Radio Directive ETSI 300 328 V2.2.2

Continued on next page!

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or wireless W-Modbus

Dimensional drawing **Iduna 3**
[mm]

RYMASKON® **13xx**
RYMASKON® **14xx**



Standard design with
display and touch keys
e.g. **type 14x1-LB**



e.g. **type 14x1-BB**



TECHNICAL DATA	(continuation)
TEMPERATURE	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.5 K at +25 °C
HUMIDITY	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	(optional)
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C
AIR QUALITY (VOC)	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to 0...30 000 ppb ethanol equiv.)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Modbus
W-Modbus

S+S REGELTECHNIK

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or wireless W-Modbus

Basic models
(see type table)
Iduna 3

Type 1311 / 1321



Type 1312 / 1322



Type 1431 / 1441 / 1451



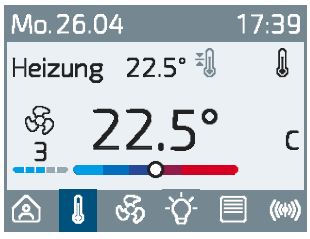
Type 1432 / 1442 / 1452



KEY FEATURES

Basic models
(see type table)

- Power supply 24 V AC/DC or 230 VAC
- **Modbus** connection or wireless **W-Modbus**
- 2.0" TFT **display** (320 x 240 x 3 RGB pixels),
  with LED backlighting, high contrast, 85° viewing angle
  (LED display on request)
- Capacitive **touch keys**
  (optional extension to max. 10 keys)
- **Housing** Iduna 3 (111 x 89 mm), white and black colours,
  for wall-mounting on in-wall flush boxes,
  quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)
  (CO2 and VOC sensors available as an option)
- **Control** of heating, cooling, 6-way valve, fan
- **Control** of temperature, fan
  (sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features**
  such as automatic brightness adjustment, stand-by, wake-up, etc.





Display symbols

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or wireless W-Modbus

Type 132xC-MOD

3 AO (h, c, 6W)

01	free
02	free
03	free
04	free
05	**AO3** 0-10V (6-way valve)
06	**AO2** 0-10V (cooling)
07	**AO1** 0-10V (heating)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

Type 143xC-MOD

2 AO (h, c, 6W) + 1 AO (f)

01	free
02	free
03	free
04	free
05	**AO3** 0-10V (fan)
06	**AO2** 0-10V (cooling, 6-way valve)
07	**AO1** 0-10V (heating, 6-way valve)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

Type 136xC-MOD
Type 146xC-MOD

2 AO (h, c, f) + 2 DO (h, c)

01	**DO2** (NO/NC contact, 400mA, cooling)
02	**DO1** (NO/NC contact, 400mA, heating)
03	Root/COM (24V, max.1A ohm load)
04	free
05	free
06	**AO2** 0-10V (cooling, fan)
07	**AO1** 0-10V (heating, fan)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

Type 132xC-WMOD

3 AO (h, c, 6W)

01	free
02	free
03	free
04	free
05	**AO3** 0-10V (6-way valve)
06	**AO2** 0-10V (cooling)
07	**AO1** 0-10V (heating)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free

Type 143xC-WMOD

2 AO (h, c, 6W) + 1 AO (f)

01	free
02	free
03	free
04	free
05	**AO3** 0-10V (fan)
06	**AO2** 0-10V (cooling, 6-way valve)
07	**AO1** 0-10V (heating, 6-way valve)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free

Type 136xC-WMOD
Type 146xC-WMOD

2 AO (h, c, f) + 2 DO (h, c)

01	**DO2** (NO/NC contact, 400mA, cooling)
02	**DO1** (NO/NC contact, 400mA, heating)
03	Root/COM (24V, max.1A ohm load)
04	free
05	free
06	**AO2** 0-10V (cooling, fan)
07	**AO1** 0-10V (heating, fan)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free

Type 131xC-WMOD

2 RO (h, c) + 1 AO (6W)

01	**L** (230V AC)
02	**N** (230V AC)
03	**DI2** (230V AC) - Ref N
04	**RO2** Cooling relay (solid state, 0.5A)
05	**RO1** Heating relay (solid state, 0.5A)
06	free
07	free
08	free
11	Output 0-10V (6-way valve)
12	GND (NTC10K/DI1)
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)

Type 145xC-WMOD

2 RO (h, c) + 1 AO (f)

01	**L** (230V AC)
02	**N** (230V AC)
03	**DI2** (230V AC) - Ref N
04	**RO2** Cooling relay (solid state, 0.5A)
05	**RO1** Heating relay (solid state, 0.5A)
06	free
07	free
08	free
11	Output 0-10V (Fan)
12	GND (Output 0-10V)
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)

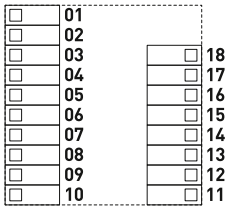
Type 144xC-WMOD

2 RO (h, c) + 3 RO (f)

01	**L** (230V AC)
02	**N** (230V AC)
03	**DI2** (230V AC) - Ref N
04	**RO2** Cooling relay (solid state, 0.5A)
05	**RO1** Heating relay (solid state, 0.5A)
06	**RO5** **Fan level 3** relay (mechanical, 3A)
07	**RO4** **Fan level 2** relay (mechanical, 3A)
08	**RO3** **Fan level 1** relay (mechanical, 3A)
11	free
12	free
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)

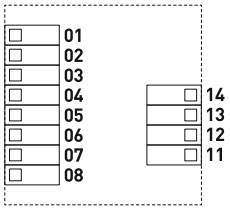
Connection diagram
24 V

Pin 01-18



Connection diagram
230 V

Pin 01-14



Modbus W-Modbus

S+S REGELTECHNIK

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or wireless W-Modbus

RYMASKON® 1000 C Controller (series)
Number key for type versions

R Y M 1 - x x x 1 - x x x 0 - 0 x x

Pos. 1-4 **Type name**
RYMASKON 1000 C — RYM1

Pos. 5-6 **Controller type**
Setpoint adjustment I outputs

Temperature
- [1] 2 **RO** (h,c) + 1 **AO** (6W) — *1 31
- [2] 3 **AO** (h,c, 6W) — 32
- [3] 2 **AO** (h,c) + 2 **DO** (h,c) — 36

Temperature + fan
- [4] 2 **AO** (h,c, 6W) + 1 **AO** (f) — 43
- [5] 2 **RO** (h,c) + 3 **RO** (f) — *1 44
- [6] 2 **RO** (h,c) + 1 **AO** (f) — *1 45
- [7] 2 **AO** (h,c, f) + 2 **DO** (h,c) — 46

Pos. 7 **Housing colour**
- White — 1
- Black — 2

Pos. 8 **Visual indication**
- TFT display (2.0") — 1

Pos. 9 **Communication**
- Modbus — *2 M
- W-Modbus — W
- without — 0

Pos. 10 **Sensors** *3
- **T** [°C/°F] — 1
- **T** [°C/°F], **RH** [%] — 2
- **T** [°C/°F], **CO2** [ppm] — 3
- **T** [°C/°F], **VOC** [%] — 4
- **T** [°C/°F], **CO2** [ppm], **VOC** [%] — 5
- **T** [°C/°F], **RH** [%], **CO2** [ppm] — 6
- **T** [°C/°F], **RH** [%], **VOC** [%] — 7
- **T** [°C/°F], **RH** [%], **CO2** [ppm], **VOC** [%] — 8

Pos. 11 **Voltage supply**
- 24 V AC/DC — 1
- 230 V AC — 2

Pos. 12 **Mounting**
- on in-wall flush box, Ø 55 mm — 0

Pos. 14-15 **Touch key extension** *4
- Basic model (cf. **Pos. 5**) including room occupancy — 00
- + **B** (1 sun protection) — 01
- + **BB** (2 sun protection) — 02
- + **L** (1 light) — 03
- + **LL** (2 light) — 04
- + **LB** (1 light, 1 sun protection) — 05

*1 230 V units
*2 not with 230 V unitsn
*3 With units without bus (cf. **Pos. 9**) no output, display only
*4 Adjustment of sun protection (**B**) and light (**L**) is only possible via bus

Outputs
- **AO** Analogue (0-10 V DC)
- **RO** Relay (230 V AC)
- **DO** Digital (24 V DC)
- (h,c) heating, cooling
- (f) Fan
- (6 W) 6-way valve

Sensors
- **T** Temperature [°C/°F]
- **RH** Relative humidity [%]
- **CO2** Carbon dioxide [ppm]
- **VOC** Air quality [%]

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT display,
with Modbus connection or wireless W-Modbus

RYMASKON® 13xx C	**Controller** (basic model) for heating convectors (**HC**) for temperature adjustment						
Type / WG02 Control outputs	Communi-cation	Measuring element	Control system	Colour / Housing	Display	Item no.	Price
[1] 2 RO (heating, cooling, 230 V AC, max. 500 mA) + 1 AO (6-way valve, 0-10 V)							
RYMASKON® **131x C**				**Iduna 3**			
RYM 1311C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3111-**W**220-000	**306,51 €**
RYM 1312C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3121-**W**220-000	**306,51 €**
[2] 3 AO (heating, cooling, 6-way valve, 0-10 V)							
RYMASKON® **132x C**				**Iduna 3**			
RYM 1321C-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3211-M210-000	**226,51 €**
RYM 1322C-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3221-M210-000	**226,51 €**
RYM 1321C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3211-**W**210-000	**306,51 €**
RYM 1322C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3221-**W**210-000	**306,51 €**
[3] 2 AO (heating, cooling, 0-10 V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)							
RYMASKON® **136x C**				**Iduna 3**			
RYM 1361C-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3611-M210-000	**226,51 €**
RYM 1362C-RH-MOD	Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3621-M210-000	**226,51 €**
RYM 1361C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	white	■	RYM1-3611-**W**210-000	**306,51 €**
RYM 1362C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | – | **R**	black	■	RYM1-3621-**W**210-000	**306,51 €**

RYMASKON® 14xx C	**Controller** (basic models) for **FAN COILS** for temperature and fan adjustment						
Type / WG02 Control outputs	Communi-cation	Measuring element	Control system	Colour / Housing	Display	Item no.	Price
[4] 3 AO (heating, cooling 6-way valve, EC fan, 0-10 V)							
RYMASKON® **143x C**				**Iduna 3**			
RYM 1431C-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4311-M210-000	**226,51 €**
RYM 1432C-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4321-M210-000	**226,51 €**
RYM 1431C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4311-**W**210-000	**306,51 €**
RYM 1432C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4321-**W**210-000	**306,51 €**
[5] 5 RO (heating, cooling, 230 VAC, max. 500 mA | 3-level fan, 230 VAC, max. 3 A)							
RYMASKON® **144x C**				**Iduna 3**			
RYM 1441C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4411-**W**220-000	**306,51 €**
RYM 1442C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4421-**W**220-000	**306,51 €**
[6] 2 RO (heating, cooling, 230 VAC, max. 500 mA) + 1 AO (EC fan, 0-10 V)							
RYMASKON® **145x C**				**Iduna 3**			
RYM 1451C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4511-**W**220-000	**306,51 €**
RYM 1452C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4521-**W**220-000	**306,51 €**
[7] 2 AO (heating, cooling, EC fan, 0-10 V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)							
RYMASKON® **146x C**				**Iduna 3**			
RYM 1461C-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4611-M210-000	**226,51 €**
RYM 1462C-RH-MOD	Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4621-M210-000	**226,51 €**
RYM 1461C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	white	■	RYM1-4611-**W**210-000	**306,51 €**
RYM 1462C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	**T** | **F** | **R**	black	■	RYM1-4621-**W**210-000	**306,51 €**
Measuring element / control system:	**T** = Temperature sensor (basic equipment) **RH** = Humidity sensor		**T** = Temperature **F** = Fan **R** = Room occupancy				

OPTIONS			
Measuring elements:	**CO2** = CO2 sensor	Extra charge	**123,60 €**
	VOC = VOC sensor	Extra charge	**120,51 €**
Control:	**B** / **L** Keys for sun protection and/or light (cf. **Pos. 14-15**)	on request	
Communication:	without Modbus	on request	
Optional:	**More type versions on request!** For configuration options, see number key (left)		

RYMASKON® 2000 Interface
RYMASKON® 3000 Interface

Interface for controlling temperature, fan, light and sun protection, room control unit with colour TFT touch display, with Modbus connection or W-Modbus (wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

The room control units of the **RYM**ASKON® **1000** / **2000** / **3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYM**ASKON® **2000** (4.3" interface) and **RYM**ASKON® **3000** (5.0" interface) are used to control temperature, fans, sun protection (Venetian blinds, shutters) or light. The room control units make the setpoints available to the BMS either via conventionally wired Modbus or via the wireless, radio-based W-Modbus. Visual indication and control take place via TFT **touch display**.

In addition to the integrated temperature and humidity sensor, **sensors** for CO2 and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are optionally available in the contemporary **housing** Iduna 5 (129 x 89 mm) and Iduna 6 (143 x 98 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes (available upon request).

TECHNICAL DATA

Unit type:	Room control unit (interface)
Functions:	Temperature, fan, sun protection, light, presence and scenes (manual or time-controlled)
System of units:	SI (default) or Imperial (can be set in the Modbus register)
Data points:	temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [pbb], carbon dioxide (CO2) [ppm], setpoint (temperature, fan, presence)
Room quantity:	single-room controller with series **2000**, multi-room controller (up to 5 rooms) with series **3000**,
Power consumption:	typically < 4 W at 24 VDC; typically < 5.5 VA at 24 VAC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	**Modbus RTU** Slave, address range 1…247, RS 485 interface, max. 63 units, 9600 / 19200 / 38400 / 57500 baud, 8N1, even / uneven parity, 1 / 2 stop bits or **W-Modbus** Slave, address range 1...247, approx. 63 units, BMS connection is radio-based via W-Modbus gateway
Indication:	**TFT touch display**, 800 x 480 x 3 pixels (RGB), **4.3"** (approx. 96 x 55 mm) with series **2000**, **5.0"** (approx. 109 x 66 mm) with series **3000**, LED backlight, viewing angle ± 85°
Control element:	**Touch screen** for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 NTC10K (configurable as a digital input) 1 digital input for potential-free switches
Outputs:	**Modbus** / **W-Modbus** or (on request) 5 analogue outputs (0-10 V) for target temperature, fan stages, presence message, sensor values, digital output
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Housing:	Plastic, ABS material, white or black colour
Housing dimensions:	approx. 129 x 89 x 22 mm (Iduna 5) with series **2000** approx. 143 x 98 x 22 mm (Iduna 6) with series **3000**
Mounting:	Wall-mounting on in-wall flush boxes, Ø 55 mm (on-wall installation on request)
Ambient temperature:	0…+50 °C (operation); -30…+70 °C (storage)
Permitted humidity:	0…90 % RH (non-precipitating air)
Protection type:	IP 30 (as per EN 60 529)
Standards:	CE-conformity, 2014/30/EU EMC Directive (EN 60730-1/2, EN 61000-6-1/3), 2001/95/EG Product safety (EN 60730-1), Radio Directive ETSI 300 328 V2.2.2

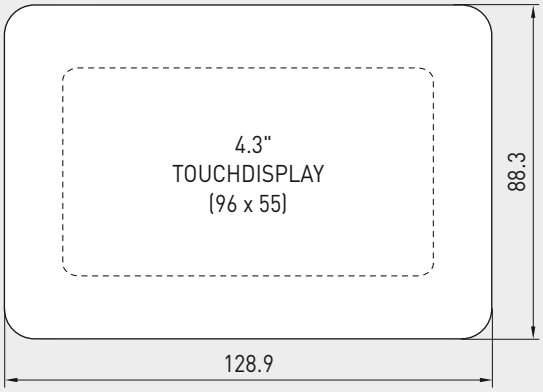
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NEW

RYMASKON® 2000 Interface
RYMASKON® 3000 Interface

Interface for controlling temperature, fan, light and sun protection, room control unit with colour TFT touch display, with Modbus connection or W-Modbus (wireless)

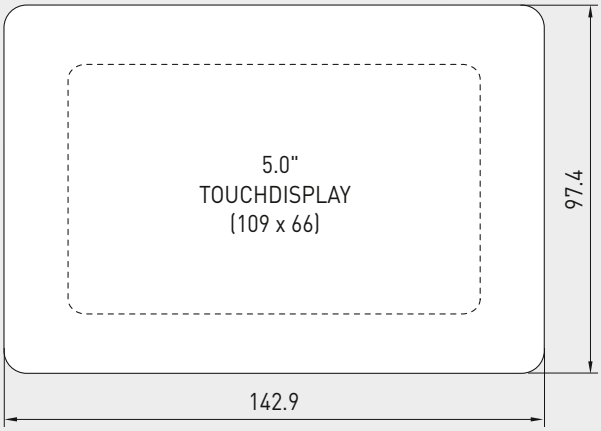
Iduna 5 housing
[mm]



RYMASKON® **2000**



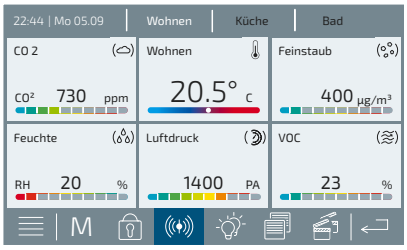
Iduna 6 housing
[mm]

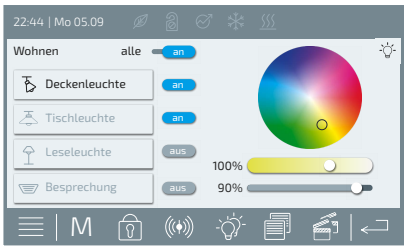


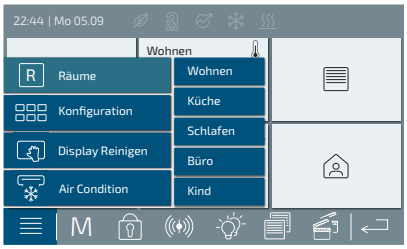
RYMASKON® **3000**



Display symbols







TECHNICAL DATA (continuation)

TEMPERATURE	
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.5 K at +25 °C
HUMIDITY	
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C
AIR QUALITY (VOC)	
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to 0...30 000 ppb ethanol equiv.)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

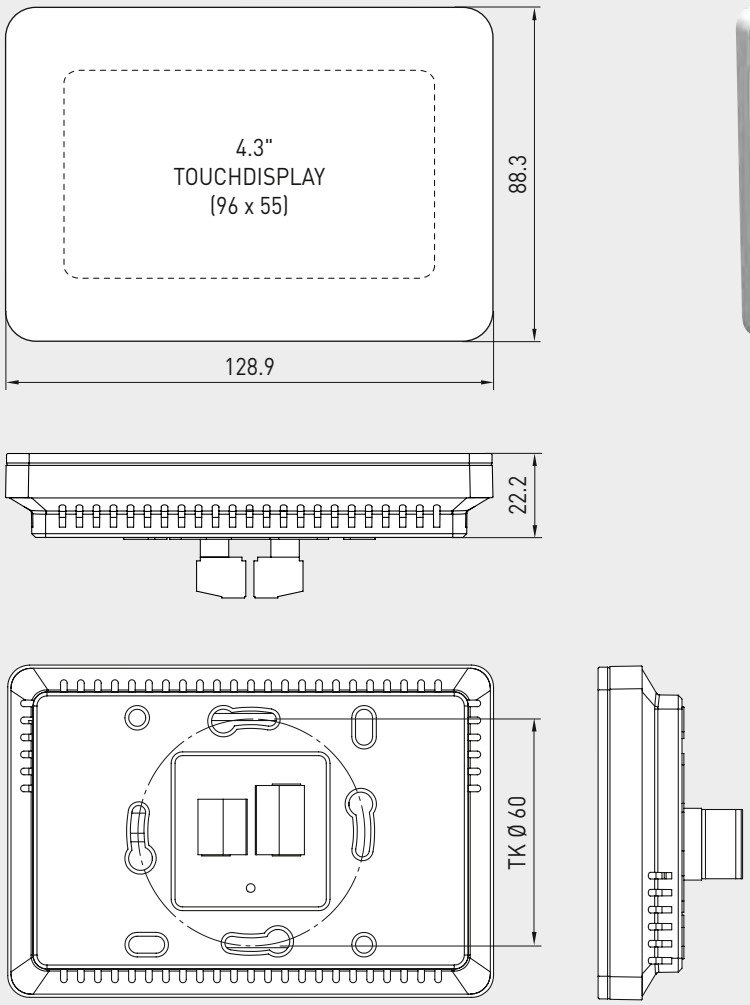
Interface for controlling temperature, fan, light and sun protection, room control unit with colour TFT touch display, with Modbus connection or W-Modbus (wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

Dimensional drawing **Iduna 5**
[mm]

RYMASKON® **2000**







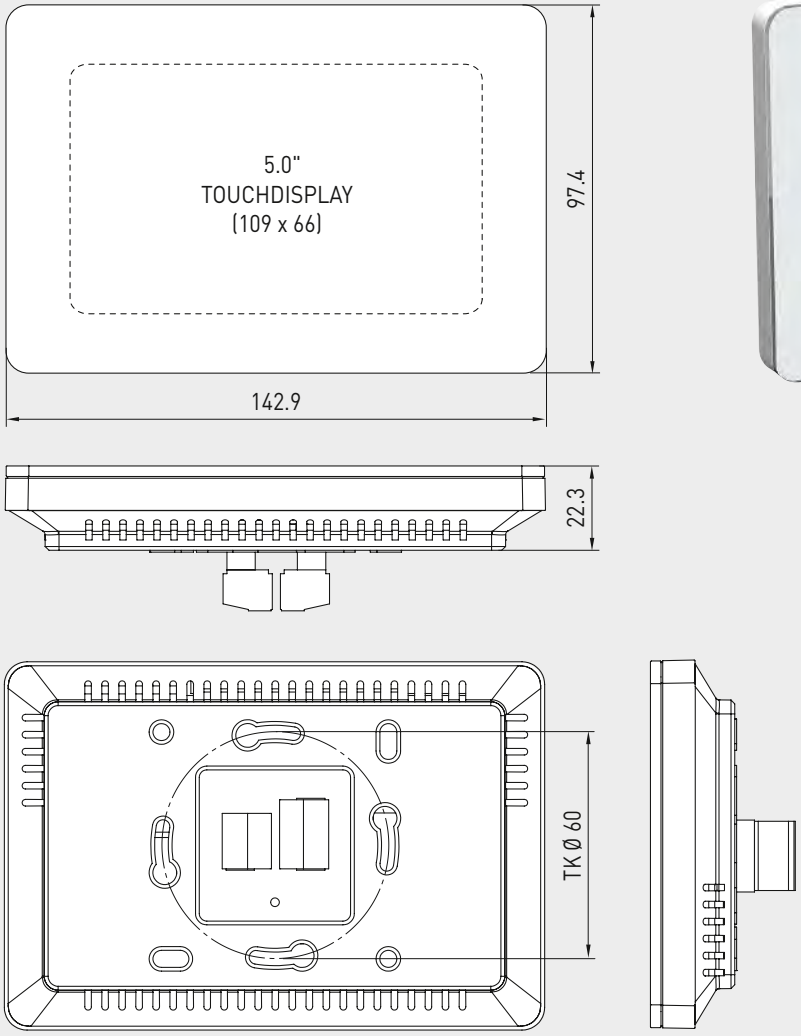
Type 2001



Type 2002

Interface for controlling temperature, fan, light and sun protection, room control unit with colour TFT touch display, with Modbus connection or W-Modbus (wireless)

Dimensional drawing **Iduna 6**
[mm]



RYMASKON® **3000**





Type 3001



Type 3002

RYMASKON® 2000 Interface
RYMASKON® 3000 Interface

Interface for controlling temperature, fan, light and sun protection, room control unit with colour TFT touch display, with Modbus connection or W-Modbus (wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

KEY FEATURES

Standard models (see type table)

- 24 V AC/DC voltage supply
- **Modbus** connection or wireless **W-Modbus**
- **4.3"** (approx. 96 x 55 mm) or **5.0"** (approx. 109 x 66 mm) TFT **touch display**, 800 x 480 x 3 pixels (RGB), with LED backlight, high contrast, 85° viewing angle
- **Housing** Iduna S (129 x 89 x 22 mm) or Iduna G (143 x 98 x 22 mm), optionally in white and black colours, for wall-mounting on in-wall flush boxes (on-wall on request), quick and easy installation via push-in terminals
- **Sensors** for temperature, humidity, CO2 and VOC
- **Regulation** of heating, cooling, fan via Modbus/W-Modbus
- **Control** of temperature and fans, as well as up to 4 sun protection and light circuits
- Up to 8 **scenes** with start and end time can be programmed
- **Multi-room controller** for up to 5 rooms (series 3000 only)
- Power-saving and environmentally friendly thanks to **features** such as automatic brightness adjustment, stand-by, wake-up, etc.

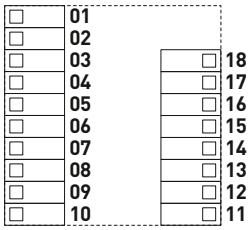


Type 2001



Type 3002

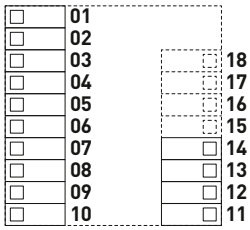
RYMASKON **2000-MOD** Interface
RYMASKON **3000-MOD** Interface



01 free
02 free
03 free
04 free
05 free
06 free
07 free
08 free
09 GND (DI2)
10 **DI2**

11 **UB+** 24V AC/DC
12 **UB–** GND AC/DC
13 **NTC10K** (**DI1**, potential-free)
14 GND (NTC10K/DI1)
15 Modbus A
16 Modbus B
17 Modbus A
18 Modbus B

RYMASKON **2000-WMOD** Interface
RYMASKON **3000-WMOD** Interface



01 free
02 free
03 free
04 free
05 free
06 free
07 free
08 free
09 GND (DI2)
10 **DI2**

11 **UB+** 24V AC/DC
12 **UB–** GND AC/DC
13 **NTC10K** (**DI1**, potential-free)
14 GND (NTC10K/DI1)
15 free
16 free
17 free
18 free

RYMASKON® 2000	Interface (4.3") Room control units with touch display					
Type / WG02	**Communi-cation**	**Measuring elements / controller**	**Colour / Housing**	**Display**	**Item no.**	**Price**
RYMASKON® **2000** MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 5**			
RYM 2001-RH-MOD	Modbus	**T** | **RH**	white	■	RYM2-0011-M210-000	**435,00 €**
RYM 2002-RH-MOD	Modbus	**T** | **RH**	black	■	RYM2-0021-M210-000	**435,00 €**
RYM 2001-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	white	■	RYM2-0011-M610-000	**523,00 €**
RYM 2002-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	black	■	RYM2-0021-M610-000	**523,00 €**
RYM 2001-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM2-0011-M810-000	**602,00 €**
RYM 2002-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM2-0021-M810-000	**602,00 €**
RYMASKON® **2000 W**MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 5**			
RYM 2001-RH-**W**MOD	**W**-Modbus	**T** | **RH**	white	■	RYM2-0011-**W**210-000	**515,00 €**
RYM 2002-RH-**W**MOD	**W**-Modbus	**T** | **RH**	black	■	RYM2-0021-**W**210-000	**515,00 €**
RYM 2001-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	white	■	RYM2-0011-**W**610-000	**603,00 €**
RYM 2002-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	black	■	RYM2-0021-**W**610-000	**603,00 €**
RYM 2001-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM2-0011-**W**810-000	**682,00 €**
RYM 2002-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM2-0021-**W**810-000	**682,00 €**

RYMASKON® 3000	Interface (5.0") Room control units with touch display					
Type / WG02	**Communi-cation**	**Measuring elements / controller**	**Colour / Housing**	**Display**	**Item no.**	**Price**
RYMASKON® **3000** MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 6**			
RYM 3001-RH-MOD	Modbus	**T** | **RH**	white	■	RYM3-0011-M210-000	**465,00 €**
RYM 3002-RH-MOD	Modbus	**T** | **RH**	black	■	RYM3-0021-M210-000	**465,00 €**
RYM 3001-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	white	■	RYM3-0011-M610-000	**553,00 €**
RYM 3002-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	black	■	RYM3-0021-M610-000	**553,00 €**
RYM 3001-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM3-0011-M810-000	**632,00 €**
RYM 3002-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM3-0021-M810-000	**632,00 €**
RYMASKON® **3000 W**MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 6**			
RYM 3001-RH-**W**MOD	**W**-Modbus	**T** | **RH**	white	■	RYM3-0011-**W**210-000	**545,00 €**
RYM 3002-RH-**W**MOD	**W**-Modbus	**T** | **RH**	black	■	RYM3-0021-**W**210-000	**545,00 €**
RYM 3001-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	white	■	RYM3-0011-**W**610-000	**633,00 €**
RYM 3002-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	black	■	RYM3-0021-**W**610-000	**633,00 €**
RYM 3001-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM3-0011-**W**810-000	**712,00 €**
RYM 3002-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM3-0021-**W**810-000	**712,00 €**

OPTIONS

Equipment:	**measuring elements** **(sensors)** **T** = temperature [°C/°F] **RH** = relative humidity [%] **CO2** = carbon dioxide [ppm] **VOC** = air quality [%]	**Controller** **T** = temperature **F** = fan **R** = room occupancy **B** = sun protection (blind) **L** = light
Type versions:	Combined measuring elements **T** | **RH** | **VOC** on request On-wall housing on request	

Modbus
W-Modbus

S+S REGELTECHNIK

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT touch display,
with Modbus connection or W-Modbus (Wireless)

The room control units of the **RYM**ASKON® **1000** / **2000** / **3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYM**ASKON® **2000 C** (4.3" controller) are used to control and regulate heating convectors and fan coils, heating valves, cooling valves, 6-way valves and EC fans. Control is implemented via PI, PWM or 2-/3-point regulation. The change-over function can be used to operate 2-pipe and 4-pipe systems. Depending on the type version, the units are available with analogue outputs (0-10 V) and digital outputs (24 V). The Modbus or W-Modbus communication interface enables the climate parameters on the controller to be changed and monitored via the BMS at any time. In addition, the sun protection (Venetian blinds, shutters) and light functions can be controlled via the bus. Visual indication and control take place via TFT **touch display** (4.3").

In addition to the integrated temperature and humidity sensor, **sensors** for CO2 and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 5 (129 x 89 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes.

TECHNICAL DATA

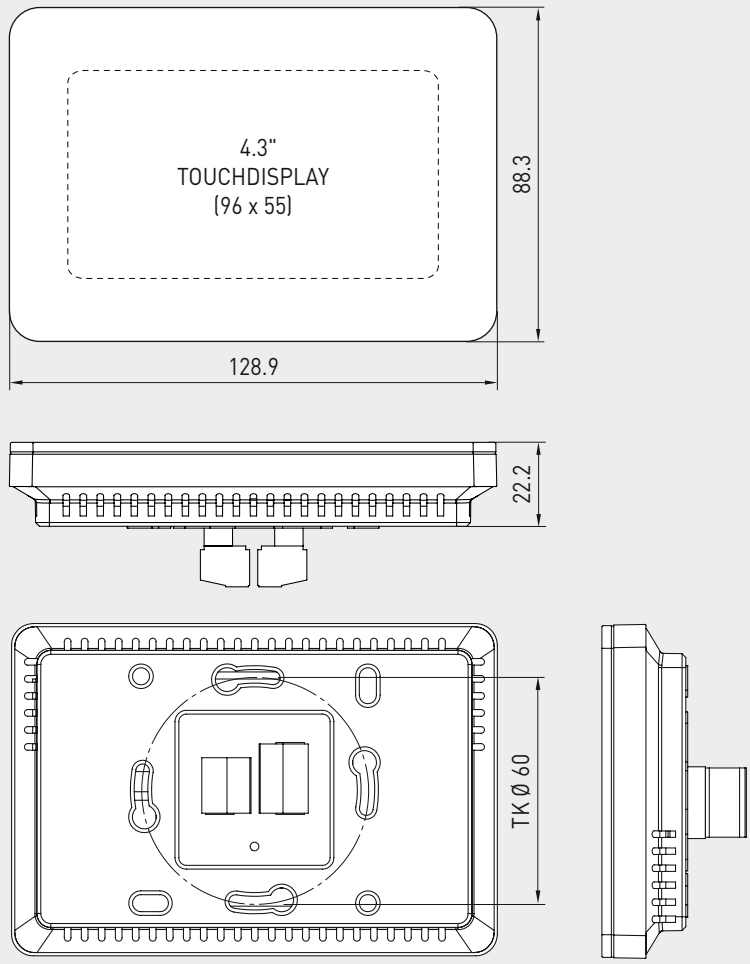
Unit type:	Room controller for heating convectors or fan coils
Functions:	Temperature, fan, sun protection, light, presence and scenes (manual or time-controlled)
System of units:	SI (default) or Imperial (can be set in the Modbus register)
Data points:	temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [pbb], carbon dioxide (CO2) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 4 W at 24 V DC; typically < 5.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	**Modbus RTU** Slave, address range 1…247, RS 485 interface, max. 63 units, 9600 / 19200 / 38400 / 57500 baud, 8N1, even / uneven parity, 1 / 2 stop bits or **W-Modbus** Slave, address range 1…247, approx. 63 units, BMS connection is radio-based via W-Modbus gateway
Indication:	**TFT touch display**, 800 x 480 x 3 Pixel (RGB), **4.3"** (approx. 96 x 55 mm), LED backlight, viewing angle ± 85°
Control element:	**Touch screen** for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 Input **NTC10K** (configurable as a digital input **DI1**, potential-free) 1 Digital input **DI2** for potential-free switches
Outputs:	**Type 203x** 3 Analogue outputs **AO** (0-10 V DC, max. 5 mA) as **PI-controllers** **Type 206x** 2 Analogue outputs **AO** (0-10 V DC, max. 5 mA) as **PI controllers,** 2 Digital outputs **DO** (I_n 400 mA, short circuit max. 1.2 A) as **2-/3-point controllers**, **PWM**
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Housing:	Plastic, ABS material, white or black colour
Housing dimensions:	approx. 129 x 89 x 22 mm (Iduna 5)
Mounting:	wall mounting on in-wall flush box, Ø 55 mm
Ambient temperature:	0…+50 °C (operation); –30…+70 °C (storage)
Permitted humidity:	0…90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE-conformity, 2014/30/EU EMC Directive (EN 60730-1/2, EN 61000-6-1/3), 2001/95/EG Product safety (EN 60730-1), Radio Directive ETSI 300 328 V2.2.2

Continued on next page!

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT touch display,
with Modbus connection or W-Modbus (wireless)

Dimensional drawing **Iduna 5**
[mm]

RYMASKON® 2000





Type 2001

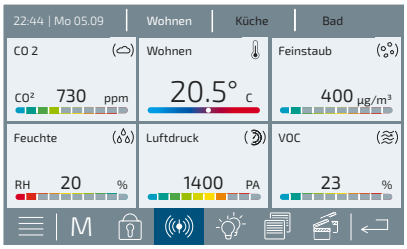


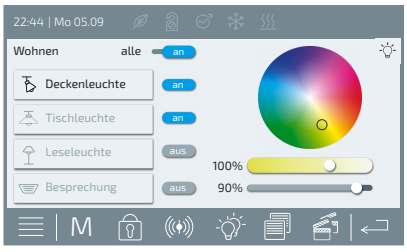
Type 2002

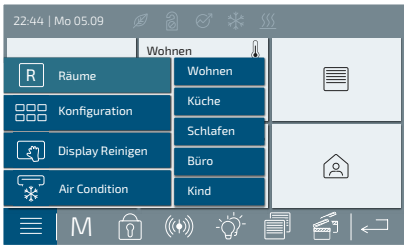
TECHNICAL DATA (continuation)

TEMPERATURE	
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.5 K at +25 °C
HUMIDITY	
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C
AIR QUALITY (VOC)	
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to 0...30 000 ppb ethanol equiv.)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Display symbols







Modbus
W-Modbus

S+S REGELTECHNIK

Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT touch display,
with Modbus connection or W-Modbus (wireless)

KEY FEATURES

Standard models (see type table)

- Voltage supply 24 V AC/DC
- **Modbus** connection or wireless **W-Modbus**
- **4.3"** (approx. 96 x 55 mm) TFT **touch display**, 800 x 480 x 3 pixels (RGB), with LED backlight, high contrast, 85° viewing angle
- **Housing** Iduna 5 (129 x 89 x 22 mm), optionally in white and black colours, for wall-mounting on in-wall flush boxes quick and easy installation via push-in terminals
- **Sensors** for temperature, humidity, CO2 and VOC
- **Regulation** of heating, cooling, fan via Modbus/W-Modbus
- **Control** of heating, cooling, 6-way valve, fan
- **Control** of temperature and fans, as well as up to 4 sun protection and light circuits
- Up to 8 **scenes** with start and end time can be programmed
- Power-saving and environmentally friendly thanks to **features** such as automatic brightness adjustment, stand-by, wake-up, etc.



Type 2031 C / 2061 C



Type 2032 C / 2062 C

Type 203x C-MOD

2 AO (h, c, 6W) + 1 AO (f)

01	free
02	free
03	free
04	free
05	**A03** 0-10V (fan)
06	**A02** 0-10V (cooling, 6-way valve)
07	**A01** 0-10V (heating, 6-way valve)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

Type 206x C-MOD

2 AO (h, c, f) + 2 DO (h, c)

01	**DO2** (NO/NC contact, 400mA, cooling)
02	**DO1** (NO/NC contact, 400mA, heating)
03	Root/COM (24V, max.1A ohm load)
04	free
05	free
06	**AO2** 0-10V (cooling, fan)
07	**AO1** 0-10V (heating, fan)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

Type 203x C-WMOD

2 AO (h, c, 6W) + 1 AO (f)

01	free
02	free
03	free
04	free
05	**A03** 0-10V (fan)
06	**A02** 0-10V (cooling, 6-way valve)
07	**A01** 0-10V (heating, 6-way valve)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free

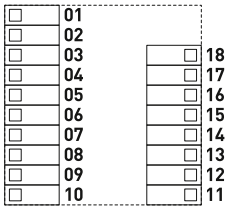
Type 206x C-WMOD

2 AO (h, c, f) + 2 DO (h, c)

01	**DO2** (NO/NC contact, 400mA, cooling)
02	**DO1** (NO/NC contact, 400mA, heating)
03	Root/COM (24V, max.1A ohm load)
04	free
05	free
06	**AO2** 0-10V (cooling, fan)
07	**AO1** 0-10V (heating, fan)
08	GND (AO)
09	GND (DI2)
10	**DI2** (potential-free)
11	**UB+** 24V AC/DC
12	**UB–** GND AC/DC
13	**NTC10K** (**DI1**, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free

Connection diagram
24 V

Pin 01-18



Controller for controlling temperature, fan, light and sun protection
Room controller with colour TFT touch display,
with Modbus connection or W-Modbus (wireless)

RYMASKON® **2000 C**	**Controller** (**4.3"**), for temperature adjustment on heating convectors (**HC**) and fan coils (**FANCOIL**)				
Type / WG02 control outputs	**Communi-cation**	**Measuring elements / controller**	**Colour / Housing**	**Display**	**Item no.**	**Price**
[1] 3 AO (heating, cooling, 6-way valve, EC fan, 0-10 V)						
RYMASKON® **203x C** MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 5**			
RYM 2031C-RH-MOD	Modbus	**T** | **RH**	white	■	RYM2-0311-M210-000	**460,00 €**
RYM 2032C-RH-MOD	Modbus	**T** | **RH**	black	■	RYM2-0321-M210-000	**460,00 €**
RYM 2031C-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	white	■	RYM2-0311-M610-000	**548,00 €**
RYM 2032C-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	black	■	RYM2-0321-M610-000	**548,00 €**
RYM 2031C-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM2-0311-M810-000	**627,00 €**
RYM 2032C-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM2-0321-M810-000	**627,00 €**
RYMASKON® **203x C W**MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 5**			
RYM 2031C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	white	■	RYM2-0311-**W**210-000	**540,00 €**
RYM 2032C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	black	■	RYM2-0321-**W**210-000	**540,00 €**
RYM 2031C-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	white	■	RYM2-0311-**W**610-000	**628,00 €**
RYM 2032C-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	black	■	RYM2-0321-**W**610-000	**628,00 €**
RYM 2031C-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM2-0311-**W**810-000	**707,00 €**
RYM 2032C-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM2-0321-**W**810-000	**707,00 €**
[2] 2 AO (heating, cooling, EC fan, 0-10 V) + **2 DO** (heating, cooling, 24 V, max. 1 A resistive load)						
RYMASKON® **206x C** MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 5**			
RYM 2061C-RH-MOD	Modbus	**T** | **RH**	white	■	RYM2-0611-M210-000	**460,00 €**
RYM 2062C-RH-MOD	Modbus	**T** | **RH**	black	■	RYM2-0621-M210-000	**460,00 €**
RYM 2061C-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	white	■	RYM2-0611-M610-000	**548,00 €**
RYM 2062C-RH-CO2-MOD	Modbus	**T** | **RH** | **CO2**	black	■	RYM2-0621-M610-000	**548,00 €**
RYM 2061C-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM2-0611-M810-000	**627,00 €**
RYM 2062C-RH-CO2-VOC-MOD	Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM2-0621-M810-000	**627,00 €**
RYMASKON® **206x C W**MOD		**T** | **F** | **R** | **B** | **L**	**Iduna 5**			
RYM 2061C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	white	■	RYM2-0611-**W**210-000	**540,00 €**
RYM 2062C-RH-**W**MOD	**W**-Modbus	**T** | **RH**	black	■	RYM2-0621-**W**210-000	**540,00 €**
RYM 2061C-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	white	■	RYM2-0611-**W**610-000	**628,00 €**
RYM 2062C-RH-CO2-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2**	black	■	RYM2-0621-**W**610-000	**628,00 €**
RYM 2061C-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	white	■	RYM2-0611-**W**810-000	**707,00 €**
RYM 2062C-RH-CO2-VOC-**W**MOD	**W**-Modbus	**T** | **RH** | **CO2** | **VOC**	black	■	RYM2-0621-**W**810-000	**707,00 €**

OPTIONS

Equipment:

measuring elements
(**sensors**)
T = temperature [°C/°F]
RH = relative humidity [%]
CO_2 = carbon dioxide [ppm]
VOC = air quality [%]

Controller
T = temperature
F = fan
R = room occupancy
B = sun protection (blind)
L = light

Type versions: Combined measuring elements **T** | **RH** | **VOC** on request

HYGRASGARD® RFTF-Modbus-xx

Roomoperating humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

S+S REGELTECHNIK

The calibratable room sensor **HYGR**ASGARD® **RFTF-Modbus** with Modbus connection, in an elegant plastic housing (Baldur 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100 % RH) and temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure) and temperature. Available as a room control unit in various type versions with **control elements** such as setpoint potentiometer (%), rotary switch (5-step), presence button or five-colour **LEDs** (colours and modes configurable) for displaying the operating states.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

RFTF-Modbus-PTD5 5L
with potentiometer, push-buttons, rotary switches and LED display



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F], relative humidity [% RH], absolute humidity [g/m³] [gr/ft³], dew point [°C] [°F], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100 % RH (humidity) 0...+ 50 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	storage –35...+85 °C; operation 0...+50 °C
Medium:	clean air and **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value **LEDs** (colour-programmable)
ACCESSORIES	see table

Display **Standard** — **RFTF-Modbus Display**



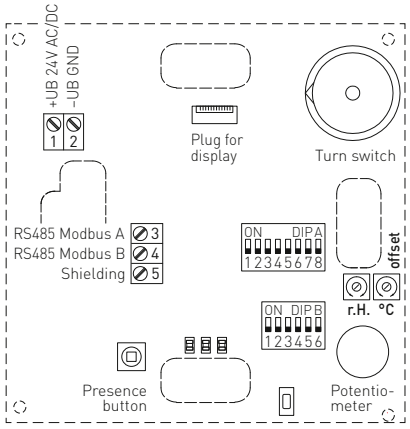


Temperature [°C] [°F]



Humidity [% RH]

Schematic diagram — **RFTF-Modbus**

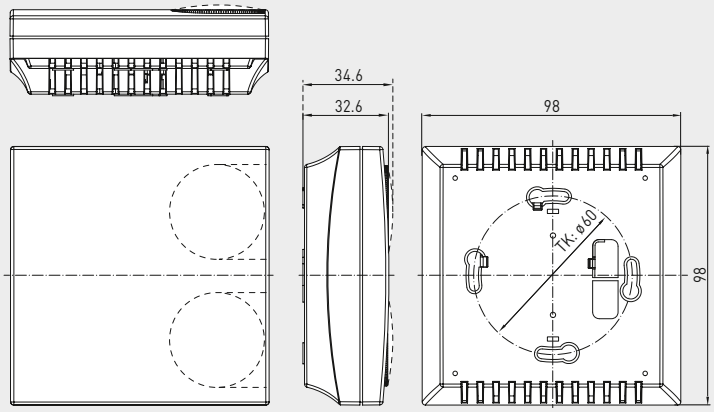


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity ...)
Telegram indicator
Reception (LED green)
Error (LED red)
LED (internal status)

Roomoperating humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

Dimensional drawing
[mm]

Housing **Baldur 2**



SI IMP

RFTF-Modbus-P T 5L
with display, potentiometer, push-buttons and LED display



Display
alternative output variables

RFTF-Modbus
Display



The display value depends on the set unit system.
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.
In this case, the first line displays the value and index while the second line displays the corresponding unit.
The index identifies the display type:

Index 1 = temperature
Index 2 = setpoint potentiometer
Index 3 = dew point
Index 4 = relative humidity
Index 5 = absolute humidity
Index 6 = mixture ratio
Index 7 = enthalpy

HYGRASGARD® RFTF-Modbus — Roomoperating humidity and temperature sensor

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RFTF-Modbus-xx						
RFTF-Modbus **P**	0...100 % RH (default) 0...80 g / kg (MR) 0...80 g / m³ (A.H.) 0...85 kJ / kg (ENT.) –20...+80 °C (DP)	0...+50 °C	Modbus		1201-42B6-6001-005	**206,52 €**
RFTF-Modbus **P LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7001-005	**245,85 €**
RFTF-Modbus **P 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6119-005	**266,30 €**
RFTF-Modbus **P 5L LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7119-005	**305,63 €**
RFTF-Modbus **P D5**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6012-841	**237,66 €**
RFTF-Modbus **P D5 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6120-841	**299,94 €**
RFTF-Modbus **P T D5 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6121-841	**314,89 €**
RFTF-Modbus **P T**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6047-005	**218,97 €**
RFTF-Modbus **P T LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7047-005	**258,30 €**
RFTF-Modbus **P T 5L**	(5 x as above)	(1 x as above)	Modbus		1201-42B6-6051-005	**281,24 €**
RFTF-Modbus **P T 5L LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-42B6-7051-005	**320,58 €**
Equipment:	**P** = Potentiometer (setpoint setter) **T** = Presence push-buttons		**D5** = Rotary switch, 5-step **5L** = LED display, multi-colour (5x)			
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485)				1906-1200-0000-100	**220,41 €**

THERMASGARD® RTM1 - Modbus

**Room operating temperature sensor, on-wall,
for temperature, dew point,
calibratable, with Modbus connection**

S+S REGELTECHNIK

The calibratable room temperature measuring transducer **THERM**ASGARD® **RTM1 - Modbus** with Modbus connection, in an elegant housing (Baldur 1) with snap-on lid, base with 4-hole attachment, optionally with/without display, for detecting room temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be retrieved via Modbus: Temperature, dew point temperature. Available as a room control unit in various type versions with setpoint potentiometer (%).

A long-term stable, **digital temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

RTM1 - Modbus
Standard



TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	**digital temperature sensor,** low hysteresis, high long-term stability
System of units:	**SI** (default) or **imperial** (can be changed via Modbus)
Data points:	temperature [°C] [°F], dew point [°C] [°F], setpoint potentiometer
Measuring range:	0...+ 50 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C adjustable by potentiometer
Ambient temperature:	storage –35...+85 °C; operation 0...+50 °C
Medium:	clean air and **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimension:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table

Display **RTM1 - Modbus**
Standard



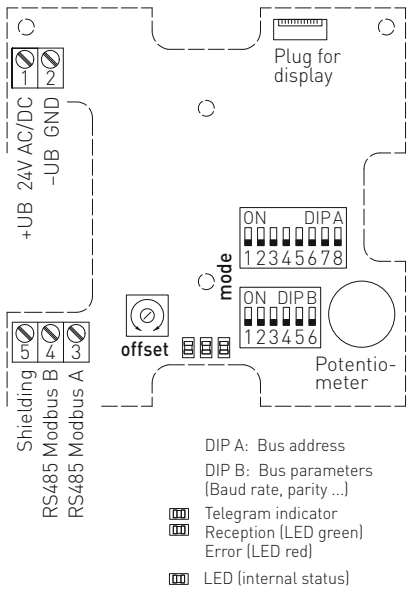


Temperature [°C] [°F]



Programmable display screen

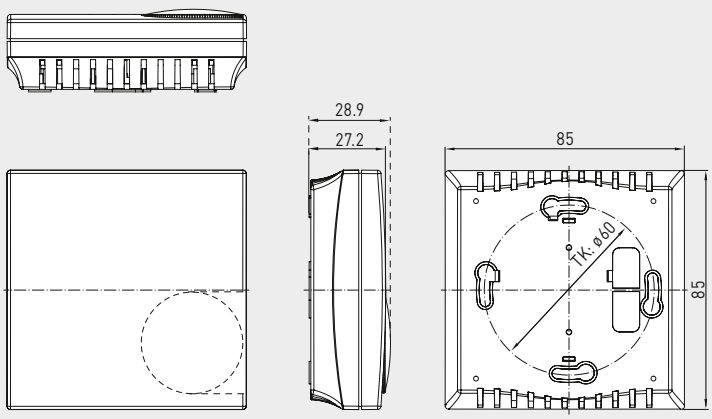
Schematic diagram **RTM1 - Modbus**



Room operating temperature sensor , on-wall, for temperature, dew point, calibratable, with Modbus connection

Dimensional drawing [mm]

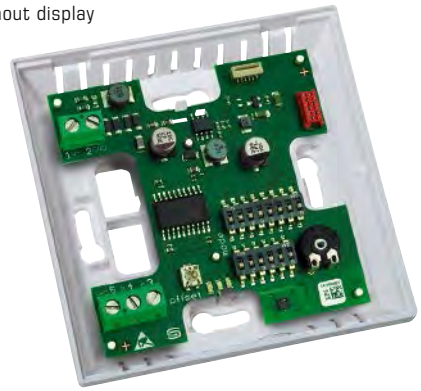
Housing **Baldur 1**



RTM1-Modbus
with display



RTM1-Modbus
without display



RTM1-Modbus
with display



RTM1-Modbus-P
with display and potentiometer



RTM1-Modbus-P
with potentiometer



THERMASGARD® RTM 1-Modbus Room operating temperature sensor

Type / WG01	Measuring Range	Output	Equipment	Display	Item No.	Price
RTM 1-Modbus					**IP 30**	
RTM1-Modbus	0...+50 °C	Modbus	–		1101-42A6-0000-000	**118,68 €**
RTM1-Modbus **LCD**	0...+50 °C	Modbus	–	■	1101-42A6-2000-000	**175,72 €**
RTM 1-P-Modbus					**IP 30**	
RTM1-Modbus P	0...+50 °C	Modbus	potentiometer		1101-42A6-0001-005	**156,03 €**
RTM1-Modbus P **LCD**	0...+50 °C	Modbus	potentiometer	■	1101-42A6-2001-005	**281,00 €**
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**

THERMASGARD® ATM 2 - Modbus - T3

Outside temperature / wet room temperature measuring transducers, calibratable, with Modbus connection

Modbus
W-Modbus

S+S REGELTECHNIK

Calibratable outside temperature measurement transducer **THERM**ASGARD® **ATM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The on-wall sensor is used to detect the temperature in gaseous media. It is used outside or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS04** (accessories).

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ATM 2 - Modbus - T3



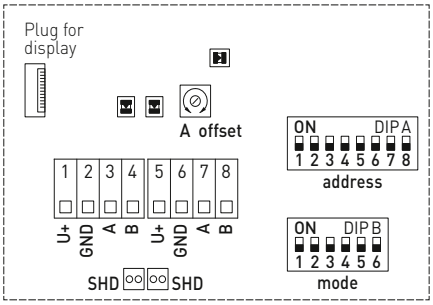
Device variant with **M12 connector** (optional on request)



TECHNICAL DATA

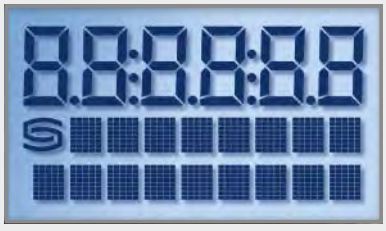
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**

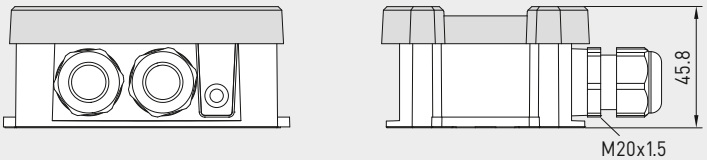


Outside temperature / wet room temperature measuring transducers, calibratable, with Modbus connection

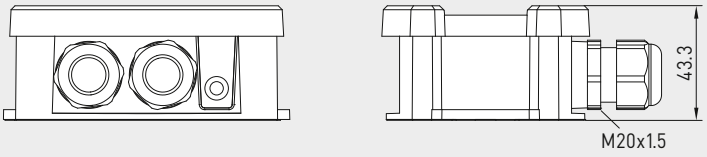
Dimensional drawing [mm]

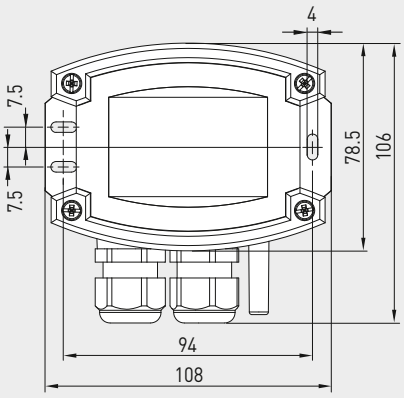
ATM 2 - Modbus - T3

with display



without display





ATM 2 - Modbus - T3
with display



SI IMP





THERMASGARD® ATM 2 - Modbus - T3 Outside temperature / wet room temperature measuring transducers

Type / WG01	Sensor	Output	Display	Item No.	Price
ATM 2 - Modbus - T3					
ATM2-Modbus-T3	Pt1000	Modbus		1101-12C6-0000-000	**172,41 €**
ATM2-Modbus-T3 **LCD**	Pt1000	Modbus	■	1101-12C6-4000-000	**228,25 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).				
ACCESSORIES					
KA2 - Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)			1906-1200-0000-100	**220,41 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks			1906-1300-0000-100	**82,20 €**
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)			7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)			7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!				

THERMASGARD® TM 65 - Modbus - T3
THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer with sensor tube **THERM**ASGARD® **TM 65 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, stainless steel-protective tube (50 - 400 mm), optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in de-energised state, internal LEDs for telegram status indication, Push terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 65 - Modbus - T3
without display



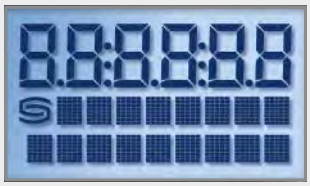
TM 65 - wModbus
without display



TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	depending on selected immersion sleeve
Communication:	**Modbus RTU** (RS485 interface for RTU cable) **or** **W-Modbus** (Wireless Modbus with 2.4 GHz ISM)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud (with RTU cable)
Signal filtering:	0.3 s / 1 s / 10 s
Protective tube:	stainless steel, **V4A** (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU, Radio Directive ETSI 300 328 V2.2.2
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

Programmable display screen **Tyr 3**



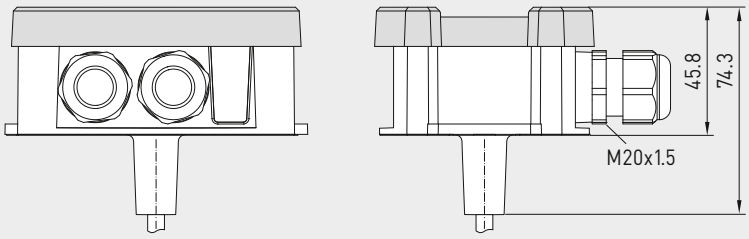
NEW

THERMASGARD® TM 65 - Modbus - T3
THERMASGARD® TM 65 - wModbus

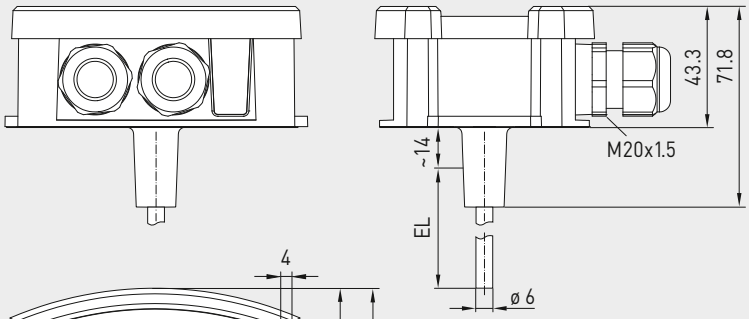
Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

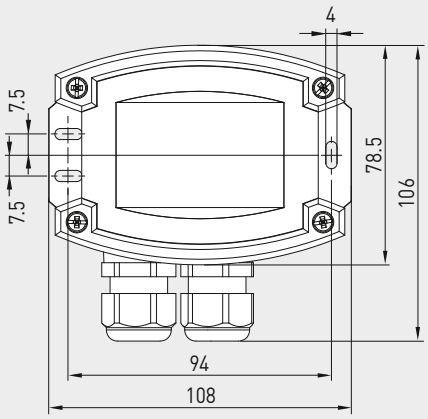
Dimensional drawing
(mm)

with display

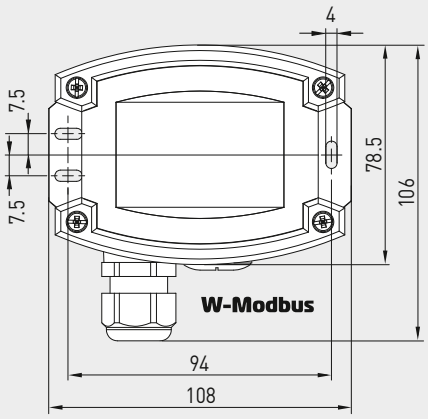


without display





TM 65 - Modbus - T3
(RTU cable)



TM 65 - wModbus
(Wireless)

TM 65 - Modbus - T3
with display



TM 65 - wModbus
with display



Device version
with **M12 connector**
(optional on request)



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

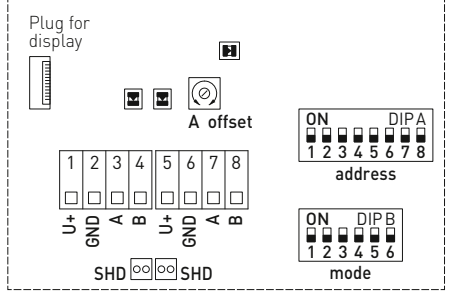
THERMASGARD® TM 65 - Modbus - T3
THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

Schematic diagram (Tyr3) — **Modbus** (RTU cable)

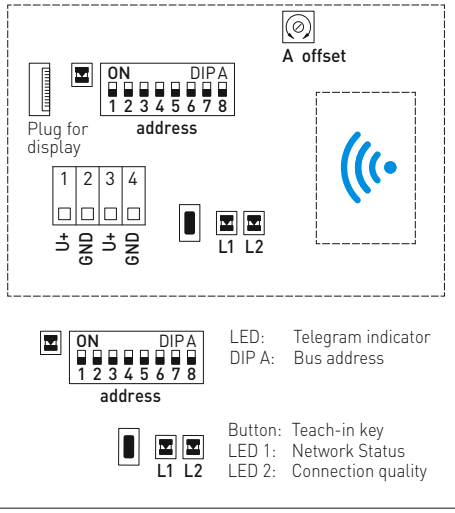


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

TM 65 - Modbus - T3



Schematic diagram (Tyr3) — **W-Modbus** (Wireless)



LED: Telegram indicator
DIP A: Bus address

Button: Teach-in key
LED 1: Network Status
LED 2: Connection quality

TM 65 - wModbus



NEW

THERMASGARD® TM 65 - Modbus - T3
THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

THERMASGARD® TM 65 - Modbus - T3	Temperature transmitter (basic device) with Modbus connection (RTU cable)				
Type / WG01	**Output**	**Installation length (EL)**	**Display**	**Item no.**	**Price**
TM65 - Modbus - T3					
TM65-Modbus-T3 50mm	Modbus	**50 mm**		1101-7236-0010-000	**172,05 €**
TM65-Modbus-T3 50mm **LCD**	Modbus	**50 mm**	■	1101-7236-4010-000	**227,88 €**
TM65-Modbus-T3 100mm	Modbus	**100 mm**		1101-7236-0020-000	**172,35 €**
TM65-Modbus-T3 100mm **LCD**	Modbus	**100 mm**	■	1101-7236-4020-000	**228,17 €**
TM65-Modbus-T3 150mm	Modbus	**150 mm**		1101-7236-0030-000	**172,58 €**
TM65-Modbus-T3 150mm **LCD**	Modbus	**150 mm**	■	1101-7236-4030-000	**228,43 €**
TM65-Modbus-T3 200mm	Modbus	**200 mm**		1101-7236-0040-000	**172,81 €**
TM65-Modbus-T3 200mm **LCD**	Modbus	**200 mm**	■	1101-7236-4040-000	**228,64 €**
TM65-Modbus-T3 250mm	Modbus	**250 mm**		1101-7236-0050-000	**173,13 €**
TM65-Modbus-T3 250mm **LCD**	Modbus	**250 mm**	■	1101-7236-4050-000	**228,99 €**
TM65-Modbus-T3 300mm	Modbus	**300 mm**		1101-7236-0060-000	**173,96 €**
TM65-Modbus-T3 300mm **LCD**	Modbus	**300 mm**	■	1101-7236-4060-000	**229,77 €**
TM65-Modbus-T3 350mm	Modbus	**350 mm**		1101-7236-0070-000	**175,03 €**
TM65-Modbus-T3 350mm **LCD**	Modbus	**350 mm**	■	1101-7236-4070-000	**190,79 €**
TM65-Modbus-T3 400mm	Modbus	**400 mm**		1101-7236-0080-000	**176,12 €**
TM65-Modbus-T3 400mm **LCD**	Modbus	**400 mm**	■	1101-7236-4080-000	**232,00 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).				
ACCESSORIES					
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection			1906-1200-0000-100	**220,41 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination			1906-1300-0000-100	**82,20 €**

THERMASGARD® TM 65 - wModbus	Temperature measuring transducer (basic device) with W-Modbus (wireless)				
Type / WG01	**Output**	**Installation length (EL)**	**Display**	**Item no.**	**Price**
TM65 - wModbus					
TM65-WMODBUS 50MM	W-Modbus	**50 mm**		1101-723F-0010-000	**212,05 €**
TM65-WMODBUS 50MM **LCD**	W-Modbus	**50 mm**	■	1101-723F-4010-000	**267,88 €**
TM65-WMODBUS 100MM	W-Modbus	**100 mm**		1101-723F-0020-000	**212,35 €**
TM65-WMODBUS 100MM **LCD**	W-Modbus	**100 mm**	■	1101-723F-4020-000	**268,17 €**
TM65-WMODBUS 150MM	W-Modbus	**150 mm**		1101-723F-0030-000	**212,58 €**
TM65-WMODBUS 150MM **LCD**	W-Modbus	**150 mm**	■	1101-723F-4030-000	**268,43 €**
TM65-WMODBUS 200MM	W-Modbus	**200 mm**		1101-723F-0040-000	**212,81 €**
TM65-WMODBUS 200MM **LCD**	W-Modbus	**200 mm**	■	1101-723F-4040-000	**268,64 €**
TM65-WMODBUS 250MM	W-Modbus	**250 mm**		1101-723F-0050-000	**213,13 €**
TM65-WMODBUS 250MM **LCD**	W-Modbus	**250 mm**	■	1101-723F-4050-000	**268,99 €**
TM65-WMODBUS 300MM	W-Modbus	**300 mm**		1101-723F-0060-000	**213,96 €**
TM65-WMODBUS 300MM **LCD**	W-Modbus	**300 mm**	■	1101-723F-4060-000	**269,77 €**
TM65-WMODBUS 350MM	W-Modbus	**350 mm**		1101-723F-0070-000	**215,03 €**
TM65-WMODBUS 350MM **LCD**	W-Modbus	**350 mm**	■	1101-723F-4070-000	**230,79 €**
TM65-WMODBUS 400MM	W-Modbus	**400 mm**		1101-723F-0080-000	**216,12 €**
TM65-WMODBUS 400MM **LCD**	W-Modbus	**400 mm**	■	1101-723F-4080-000	**272,00 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).				
ACCESSORIES					
GW-wModbus	**Gateway** with W-Modbus module, for radio-based connection to Modbus networks			1801-1211-1101-000	**229,00 €**

THERMASGARD® TM 65 - Modbus - T3
THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

One basic device in four variants ...



TM 65 - Modbus - T3 + TH 08 - ms / xx

Immersion / screw-in temperature sensor with immersion sleeve, nickel-plated / galvanised



PATENTED

TM 65 - Modbus - T3 + TH 08 - VA / xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM 65 - Modbus - T3 + TH 08 - VA / xx / 90

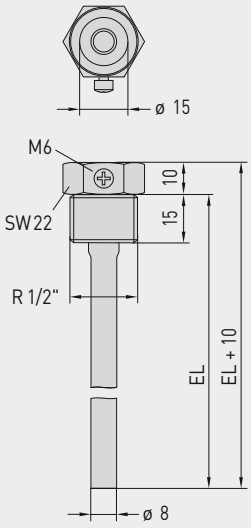
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



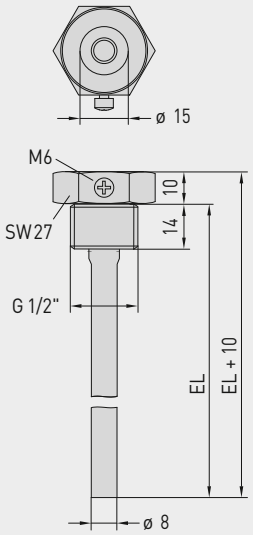
TM 65 - Modbus - T3 + MF - 15 - K

Duct temperature sensor with mounting flange, plastic

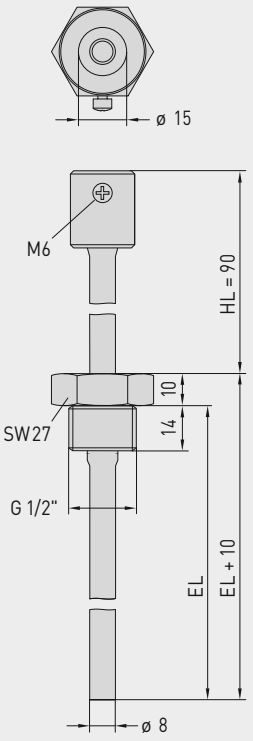
Dimensional drawing [mm]
TH 08 - ms / xx



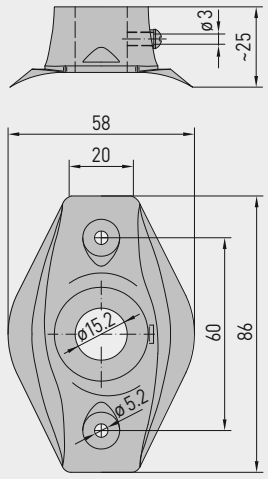
Dimensional drawing [mm]
TH 08 - VA / xx



Dimensional drawing [mm]
TH 08 - VA / xx / 90



Dimensional drawing [mm]
MF - 15 - K



NEW

THERMASGARD® TM 65 - Modbus - T3
THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

... through combination with accessories:



TH 08 - ms / xx

Immersion sleeve,
brass, nickel-plated / galvanised,
thread-sealing, conical,
according to DIN 10226



TH 08 - VA / xx

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH 08 - VA / xx / 90

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF - 15 - K

Mounting flange,
plastic

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH 08 - ms / xx	**Brass nickel-plated / galvanised**			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**12,90 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**13,50 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**14,60 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**15,62 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**18,09 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**18,90 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**19,40 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**19,90 €**
TH 08 - VA / xx	**Stainless steel V4A** (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**22,24 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**24,50 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**26,50 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**27,80 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**34,60 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**36,20 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**36,90 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**37,90 €**
TH 08 - VA / xx / 90	**Stainless steel V4A** (1.4571)			**with neck tube** (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,91 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**31,26 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**32,80 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**34,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**35,83 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**38,84 €**
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mounting flange (Accessories)			
Type / WG01B		**Item No.**	**Price**
MF			
MF - 15 - K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland, T_{max} +100°C	7100-0032-0000-000	**6,30 €**
Note:	For information see last chapter!		

THERMASGARD® MWTM - Modbus - T3

**Mean value temperature measuring transducers,
incl. mounting flange, calibratable,
with Modbus connection**

S+S REGELTECHNIK

Calibratable mean value temperature measuring transducer **THERM**ASGARD® **MWTM - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, with flexible sensor rod (0.4...20m, fully active) in a robust protective plastic-coated copper tube, incl. mounting flange, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

MWTM - Modbus - T3
Rod length
3 m / 6 m



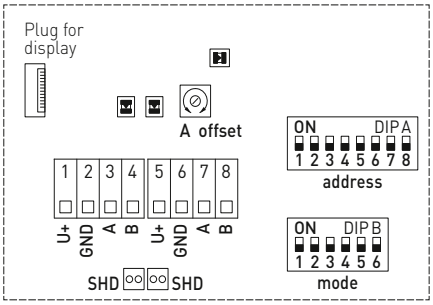
Device version
with **M12 connector**
(optional on request)



TECHNICAL DATA

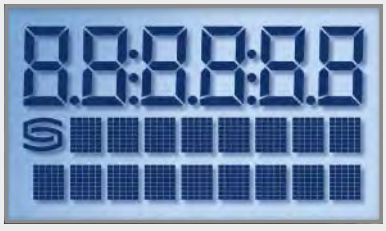
Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	– 50...+ 150 °C; T_{min} **–50 °C**, T_{max} **+80 °C**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Sensor:	active across the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated,** with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optional up to max. 20 m)
Rod laying:	Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N**
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps **MK-05-M**
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
according to:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

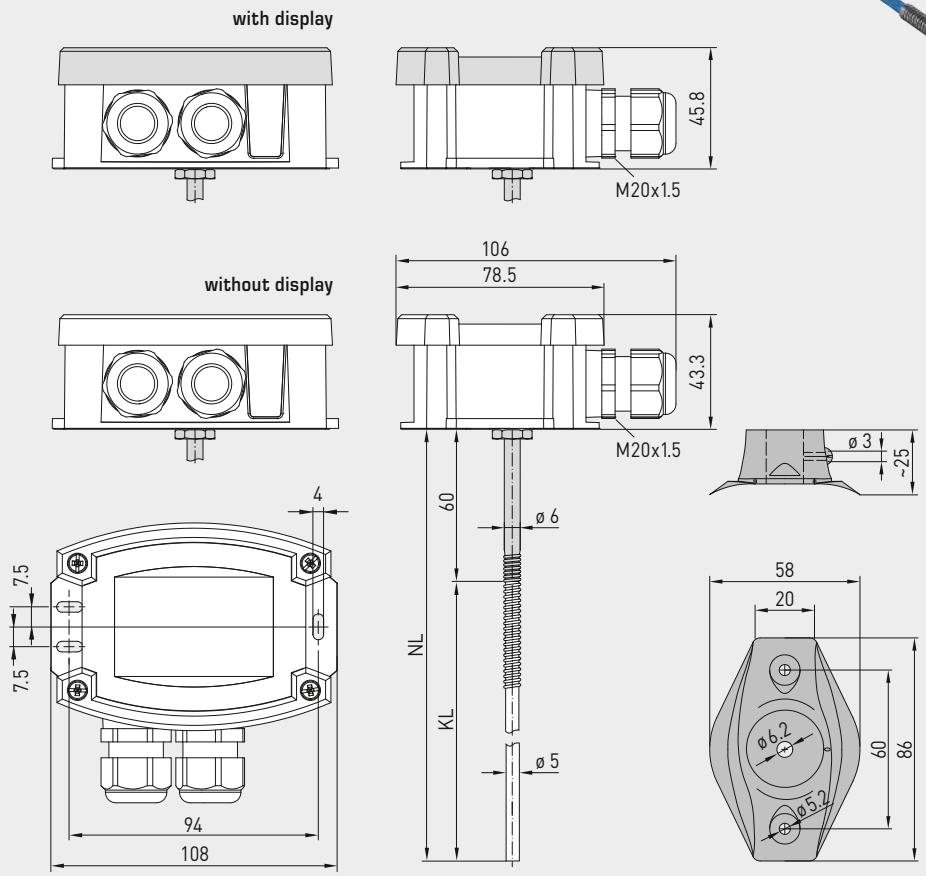
Programmable display screen **Modbus Tyr 3**



Mean value temperature measuring transducers, incl. mounting flange, calibratable, with Modbus connection

Dimensional drawing [mm]

MWTM-Modbus-T3



MWTM-Modbus-T3
Rod length 0.4 m



SI IMP

MF-06-K
Mounting flange, plastic
(included in the scope of delivery)



MK-05-M
Galvanised steel mounting clamps
(optional)



MF-06-M
Mounting flange, metal
(optional)



KRD-04
Capillary tube gland bracket, plastic
(optional)



THERMASGARD® MWTM-Modbus-T3 Mean value temperature measuring transducers

Type / WG01	Sensor	Output	Rod length (NL)	Display	Item No.	Price
MWTM-Modbus-T3					**IP 65**	
MWTM-Modbus_T3 0,4m	Pt1000	Modbus	**0.4 m**		1101-3266-0080-000	**247,56 €**
MWTM-Modbus-T3 0,4m **LCD**	Pt1000	Modbus	**0.4 m**	■	1101-3266-4080-000	**302,93 €**
MWTM-Modbus-T3 3m	Pt1000	Modbus	**3.0 m**		1101-3266-0230-000	**302,12 €**
MWTM-Modbus-T3 3m **LCD**	Pt1000	Modbus	**3.0 m**	■	1101-3266-4230-000	**358,04 €**
MWTM-Modbus-T3 6m	Pt1000	Modbus	**6.0 m**		1101-3266-0260-000	**341,29 €**
MWTM-Modbus-T3 6m **LCD**	Pt1000	Modbus	**6.0 m**	■	1101-3266-4260-000	**397,56 €**
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,30 €**
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100	**12,95 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**9,18 €**
MK-05-M	Galvanised steel **mounting clamps** (6 pieces)	7100-0034-0000-000	**10,18 €**
	For further information, see last chapter Accessories!		

THERMASGARD® HFTM - Modbus - T3

Sleeve sensor with temperature measuring transducer, calibratable, with Modbus connection

Calibratable sleeve temperature measuring transducer **THERM**ASGARD® **HFTM - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a stainless steel sleeve, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in immersion sleeve **THE** (accessories), as an immersion and screw-in sensor in liquids.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Sensor protection:	Sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	silicone, SiHF, 2 x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

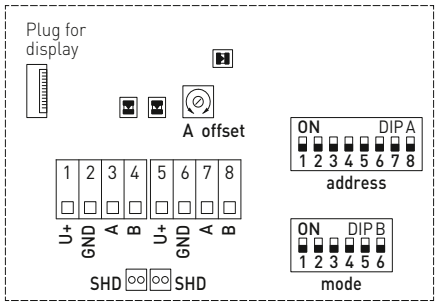
HFTM - Modbus - T3



Device version with **M12 connector** (optional on request)

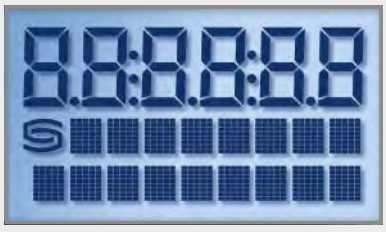


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

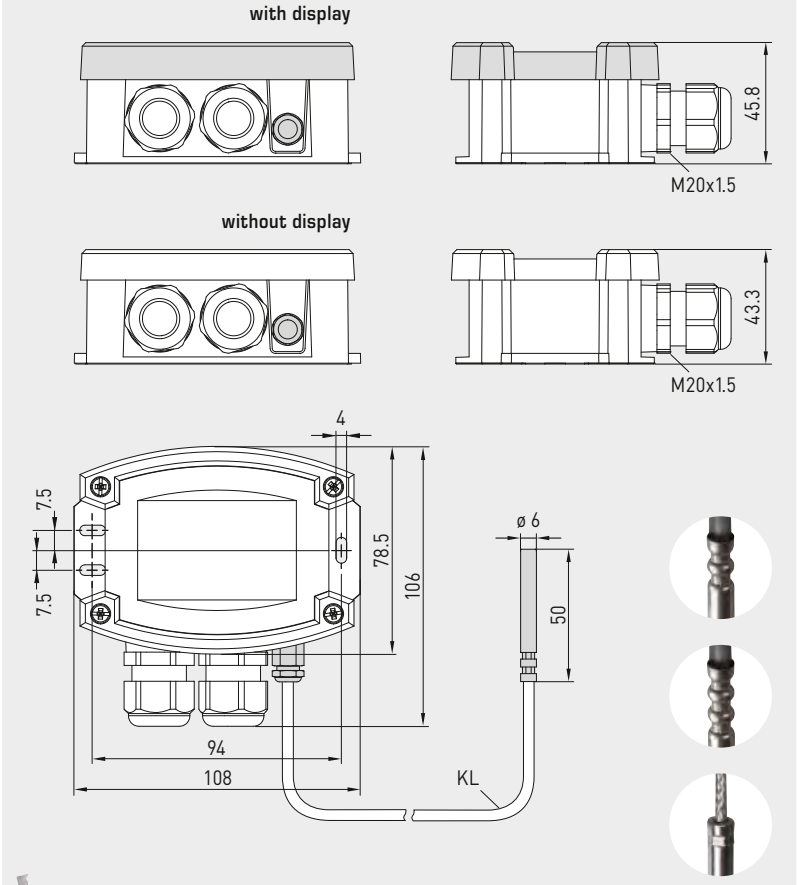
Programmable display screen **Modbus Tyr 3**



Sleeve sensor with temperature measuring transducer, calibratable, with Modbus connection

Dimensional drawing [mm]

HFTM-Modbus-T3



HFTM-Modbus-T3
with display



IP65 (standard)
humidity-tight

IP68 (optional)
water-tight
Perfect Sensor Protection

IP54 (optional)
with **glass fibre** cable



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® HFTM-Modbus-T3 Sleeve sensor with temperature measuring transducer						
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
HFTM-Modbus-T3						
HFTM-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-62A6-0210-000	**176,65 €**
HFTM-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-62A6-4210-000	**232,53 €**
Extra charge:	Protection type **IP68** (sensor sleeve watertight compound-filled)					**3,50 €**
	per running metre of connecting lead (**silicone / PTFE / glass fibre**)				on request	
	other protection sleeve lengths optional				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**
THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm, inner diameter of socket 5.2 mm, with **adjusting screw** M12 x 1.5					
	For further information, see last chapter Accessories!					

THERMASGARD® ALTM1 - Modbus - T3

Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, compact variant, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (compact variant) **THERM**ASGARD® **ALTM 1 - Modbus - T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, pipe feeder, incl. strap, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C, T_{max} **at +100 °C** (compact variant)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminal
Process connection:	Endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

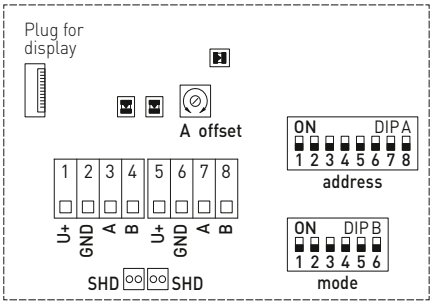
ALTM 1 - Modbus - T3



Device version with **M12 connector** (optional on request)

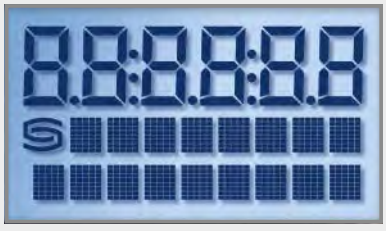


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

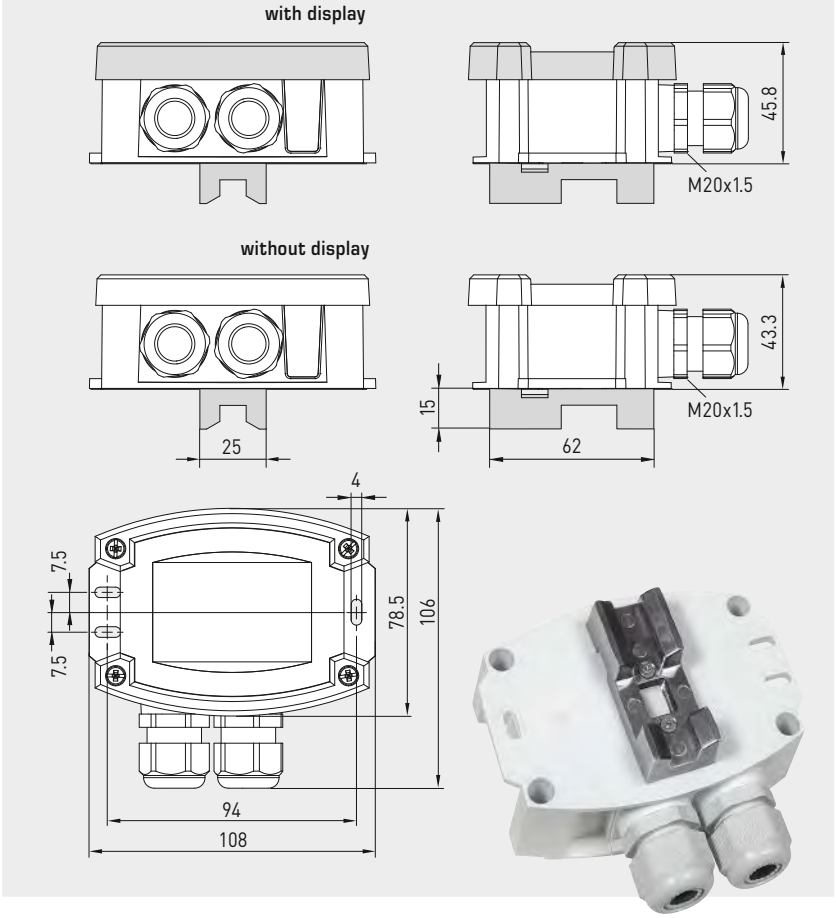
Programmable display screen **Modbus Tyr 3**



Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, compact variant, calibratable, with Modbus connection

Dimensional drawing [mm]

ALTM 1 - Modbus - T3



ALTM 1 - Modbus - T3
with display







THERMASGARD® ALTM 1 - Modbus - T3	Surface contact temperature / tube contact temperature measuring transducers					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
ALTM 1 - Modbus - T3						
ALTM1-Modbus-T3	Pt1000	Modbus	Compact		1101-12B6-0000-000	**177,19 €**
ALTM1-Modbus-T3 **LCD**	Pt1000	Modbus	Compact	■	1101-12B6-4000-000	**234,38 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**
WLP-1	**Heat-conductive paste**, silicone-free				7100-0060-1000-000	**4,79 €**
	For further information, see last chapter Accessories!					

THERMASGARD® ALTM 2 - Modbus - T3

Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, with detached sensor head, calibratable, with Modbus connection

Calibratable surface-contact temperature measuring transducer (detached variant) **THERM**ASGARD® **ALTM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with pipe feeder, incl. strap, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Measuring range:	–50...+150 °C, T_{max} **at +150 °C** (detached sensor variant)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	Silicone, SiHF, 2 x 0.25 mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminal
Process connection:	Endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

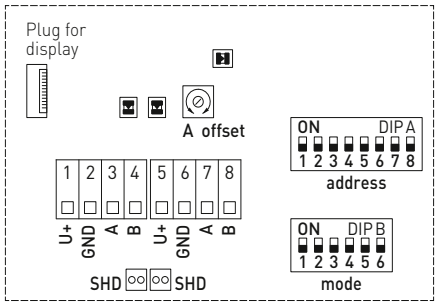
ALTM 2 - Modbus - T3



Device version with **M12 connector** (optional on request)

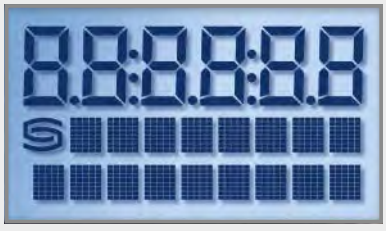


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

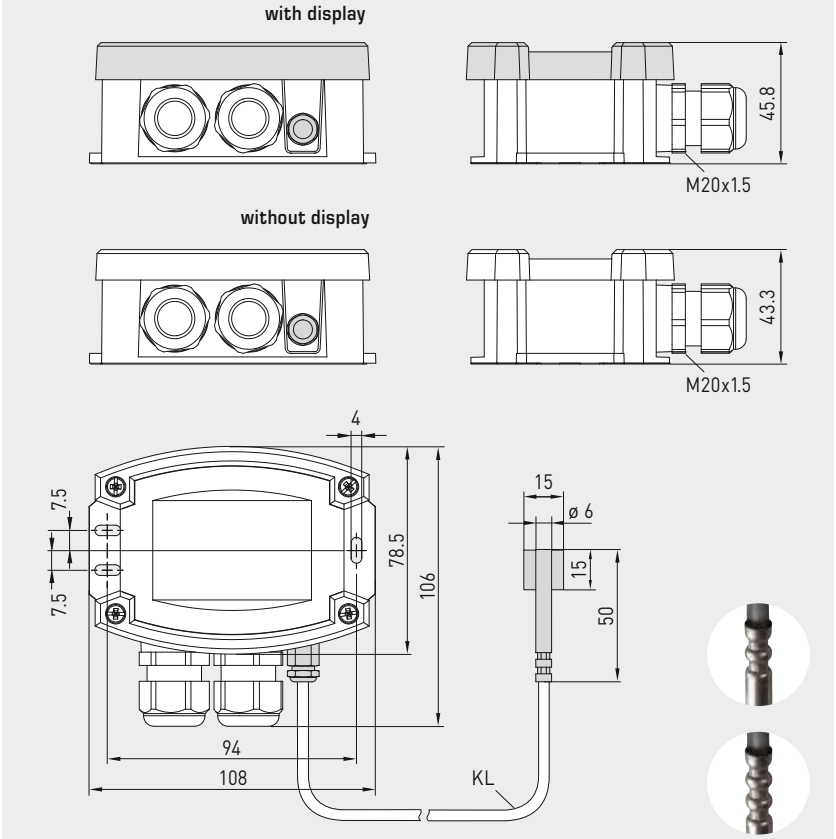
Programmable display screen **Modbus Tyr 3**



Surface-contact temperature measuring transducer / pipe surface-contact sensor incl. strap, with detached sensor head, calibratable, with Modbus connection

Dimensional drawing [mm]

ALTM 2 - Modbus - T3



ALTM 2 - Modbus - T3
with display



IP 65 (standard)
humidity-tight

IP 68 (optional)
water-tight
Perfect Sensor Protection





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTM 2 - Modbus - T3	Surface contact temperature / tube contact temperature measuring transducers					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
ALTM 2 - Modbus - T3						
ALTM2-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-62B6-0210-000	**184,63 €**
ALTM2-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-62B6-4210-000	**240,57 €**
Extra charge:	Protection type **IP 68** (sensor sleeve watertight compound-filled)					**3,50 €**
	per running metre of connecting lead (**silicone / PTFE / glass fibre**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2 - Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**
WLP-1	**Heat-conductive paste**, silicone-free				7100-0060-1000-000	**4,79 €**
	For further information, see last chapter Accessories!					

THERMASGARD® RPTM 1 - Modbus - T3

**Pendulum room temperature measuring transducer,
(with stainless steel sleeve), calibratable,
with Modbus connection**

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERM**ASGARD® **RPTM 1 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	–50...+150 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel **V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

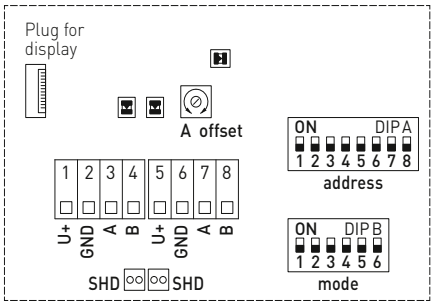
RPTM1 - Modbus - T3



Device version
with **M12 connector**
(optional on request)

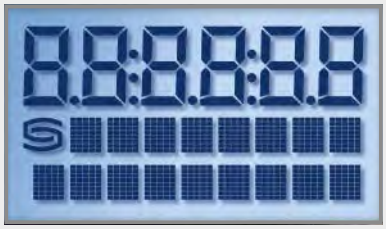


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**

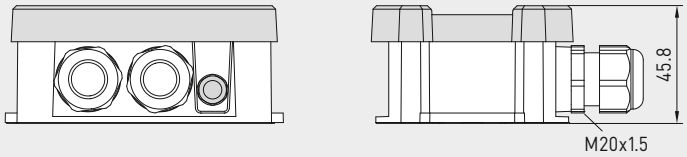


Pendulum room temperature measuring transducer, (with stainless steel sleeve), calibratable, with Modbus connection

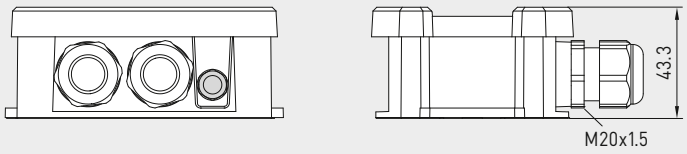
Dimensional drawing [mm]

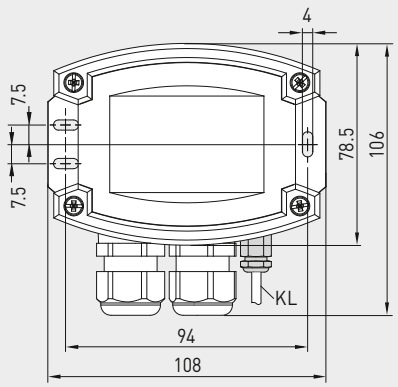
RPTM1 - Modbus - T3

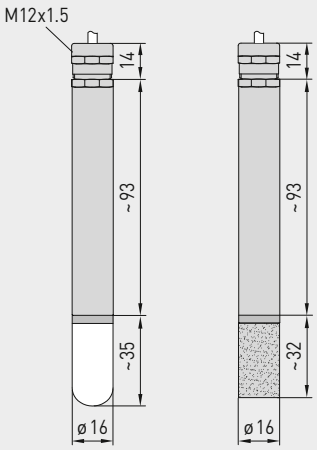
with display



without display







RPTM1 - Modbus - T3
with display



MF-16-K
Mounting flange, plastic (optional)





SF-K
with plastic sinter filter (standard)



SF-M
with metal sinter filter (optional)



THERMASGARD® RPTM 1 - Modbus - T3	Pendulum room temperature measuring transducer (with stainless steel sleeve)					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
RPTM 1 - Modbus - T3						
RPTM1-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-6286-0210-000	**221,10 €**
RPTM1-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-6286-4210-000	**277,51 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)				7000-0050-2200-100	**43,60 €**
MF-16-K	**Mounting flange** plastic (optional)				7100-0030-0000-000	**9,85 €**
	For further information, see last chapter Accessories!					

THERMASGARD® RPTM 2 - Modbus - T3

**Pendulum room temperature measuring transducer,
(with globe), calibratable,
with Modbus connection**

S+S REGELTECHNIK

Calibratable room pendulum temperature measuring transducer (with globe) **THERM**ASGARD® **RPTM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a black plastic globe, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated, with customised programming in the 7-segment range and dot-matrix range). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The error messages can be retrieved via Modbus and are shown on the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C; T_{min} **–50 °C**, T_{max} **+ 80 °C**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	Measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0,3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Globe:	plastic, colour black, Ø = 50 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	**Error 1** at sensor breakage **Error 2** at sensor short circuit

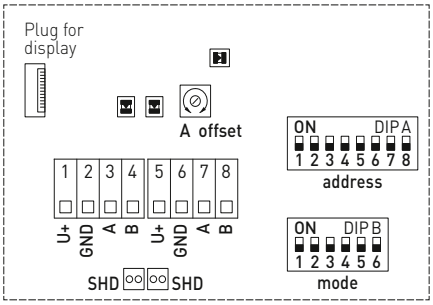
RPTM 2 - Modbus - T3



Device version
with **M12 connector**
(optional on request)

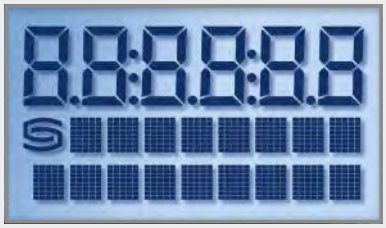


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

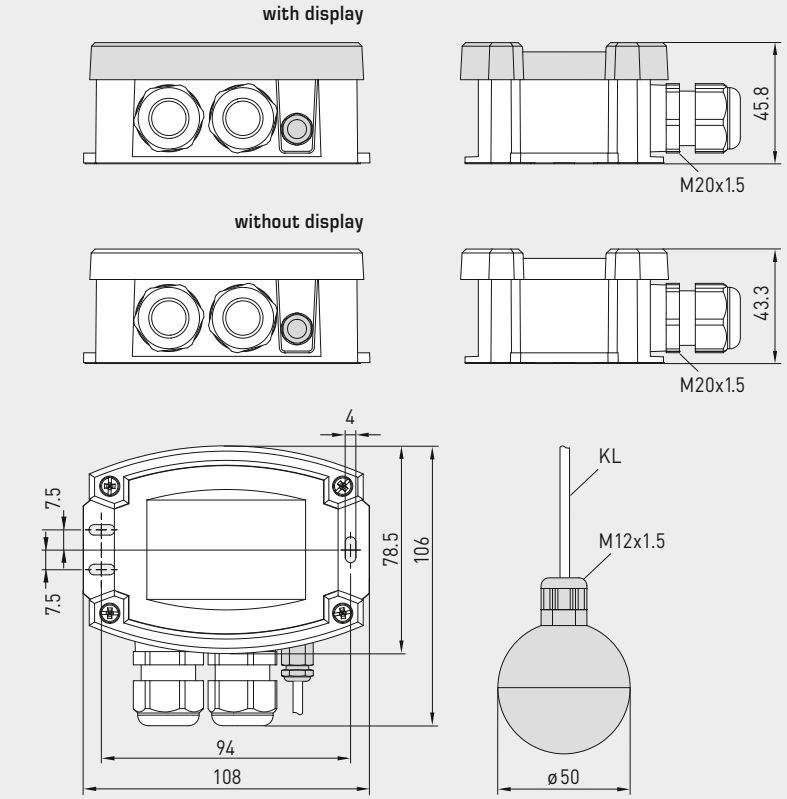
Programmable display screen **Modbus Tyr 3**



Pendulum room temperature measuring transducer, (with globe), calibratable, with Modbus connection

Dimensional drawing [mm]

RPTM2 - Modbus - T3



RPTM2 - Modbus - T3
with display







THERMASGARD® RPTM 2 - Modbus - T3	Pendulum room temperature measuring transducer (with globe)					
Type / WG01	**Sensor**	**Output**	**Type**	**Display**	**Item No.**	**Price**
RPTM 2 - Modbus - T3						
RPTM2-Modbus-T3	Pt1000	Modbus	Remote sensor		1101-6296-0210-000	**227,83 €**
RPTM2-Modbus-T3 **LCD**	Pt1000	Modbus	Remote sensor	■	1101-6296-4210-000	**284,34 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2 - Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**220,41 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**82,20 €**

HYGRASGARD® RFTF-Modbus

Room humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

S+S REGELTECHNIK

The calibratable room sensor **HYGR**ASGARD® **RFTF-Modbus** with Modbus connection, in an elegant plastic housing (Baldur 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100 % RH) and temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure) and temperature.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

RFTF-Modbus
Standard



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Temperature [°C] [°F], relative humidity [% RH], absolute humidity [g/m³] [gr/ft³], dew point [°C] [°F], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100 % RH (humidity) 0...+ 50 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	storage –35...+85 °C; operation 0...+50 °C
Medium:	clean air and **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimension:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table

Display
Standard

RFTF-Modbus
Display



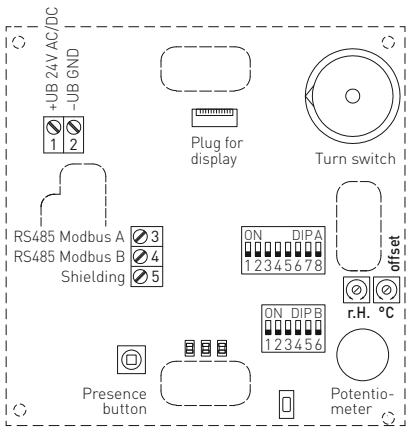


Temperature [°C] [°F]



Humidity [% RH]

Schematic diagram **RFTF-Modbus**

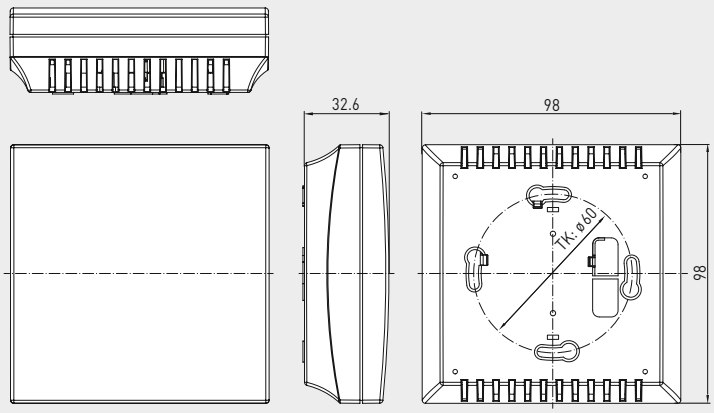


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity ...)
Telegram indicator
Reception (LED green)
Error (LED red)
LED (internal status)

Room humidity and temperature sensor (± 2.0 %), on-wall, for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, calibratable, with Modbus connection

Dimensional drawing
[mm]

Housing **Baldur 2**



RFTF-Modbus
with display



Display
alternative output variables

RFTF-Modbus
Display



The display value depends on the set unit system. By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display. In this case, the first line displays the value and index while the second line displays the corresponding unit. The index identifies the display type:

Index 1 = temperature
Index 2 = setpoint potentiometer
Index 3 = dew point
Index 4 = relative humidity
Index 5 = absolute humidity
Index 6 = mixture ratio
Index 7 = enthalpy

HYGRASGARD® RFTF-Modbus — Room humidity and temperature sensor

Type / WG01	Measuring Range / Readout Humidity (switchable)		Temperature	Output	Display	Item No.	Price
RFTF-Modbus							
RFTF-Modbus	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MR) (A.H.) (ENT.) (DP)	0...+50 °C	Modbus		1201-42B6-6000-000	**169,14 €**
RFTF-Modbus **LCD**	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MR) (A.H.) (ENT.) (DP)	0...+50 °C	Modbus	■	1201-42B6-7000-000	**208,48 €**
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).						
ACCESSORIES							
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection					1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**82,20 €**

HYGRASGARD® FSFTM - Modbus

Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

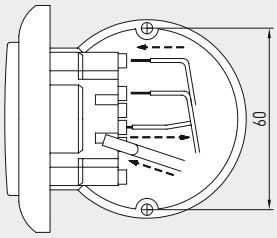
The room sensor and measuring transducer **HYGR**ASGARD® **FSFTM - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the relative humidity and temperature of the air, and for setpoint adjustment. The following parameters are calculated internally from the measured values: relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], enthalpy [kJ / kg] (ignoring atmospheric air pressure) and room temperature [°C]. The parameters are queried via the Modbus interface.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

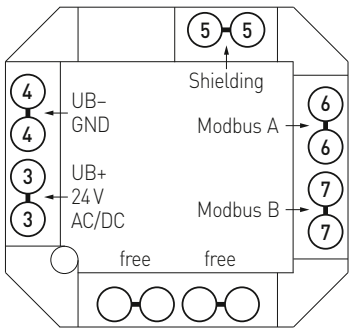
Mounting diagram **in-wall**



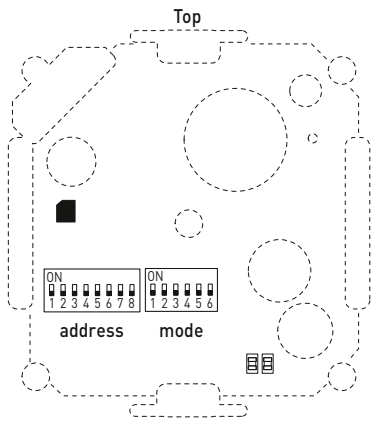
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC
Data points:	temperature [°C], relative humidity [% RH] absolute humidity [g / m³], dew point [°C], mixing ratio [g / kg], enthalpy [kJ / kg] and setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Signal filtering:	4 s / 32 s
HUMIDITY	
Sensor:	**digital humidity sensor,** **with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0…100 % RH
Operating range, humidity:	0…95 % RH (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20…80 % RH) at +25 °C, otherwise ± 5.0 %
TEMPERATURE	
Measuring range:	0…+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35…+85 °C; Operation 0…+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFTM - Modbus**

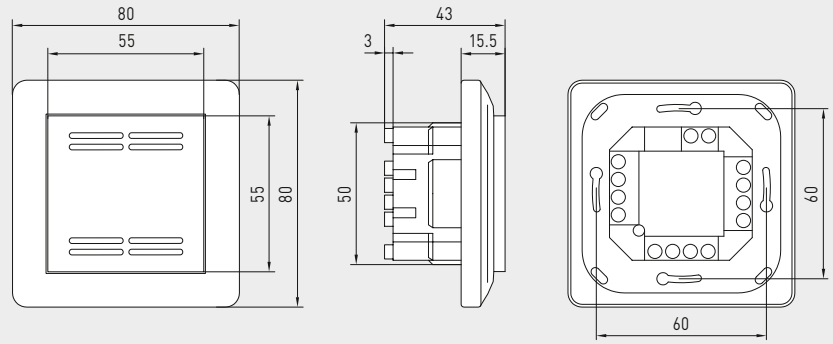


Schematic diagram **FSFTM - Modbus**



Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

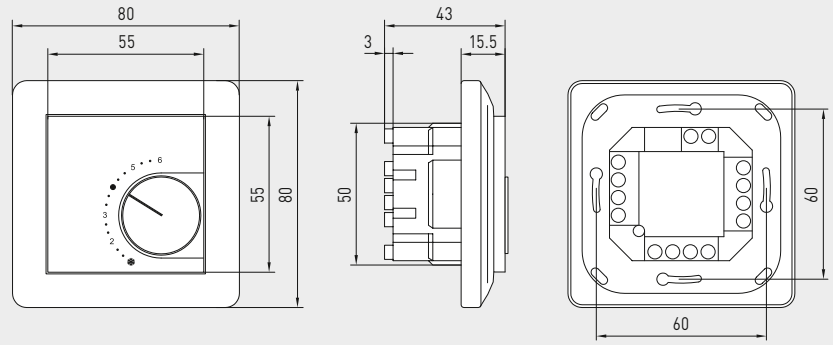
Dimensional drawing **FSFTM - Modbus**



FSFTM - Modbus
Standard



Dimensional drawing **FSFTM - Modbus - P**



FSFTM - Modbus - P
with potentiometer



HYGRASGARD® FSFTM - Modbus Room temperature and humidity sensor, in-wall

Type / WG02	Measuring Range Humidity (base value)		Temperature	Control element	Output	Item No.	Price
FSFTM - Modbus							
FSFTM-Modbus	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	0...+50 °C	–	Modbus	1201-9226-1000-162	**299,18 €**
FSFTM-Modbus P	0...100 % RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282	**323,61 €**
Data points:	relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], enthalpy [kJ / kg] (ignoring atmospheric air pressure), temperature [°C] and setpoint potentiometer						

ACCESSORIES			
KA2 - Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	**220,41 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	**82,20 €**

HYGRASGARD® AFTF - Modbus - T3

On-wall-humidity- and temperature sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Calibratable outside humidity and temperature sensor **HYGR**ASGARD® **AFTF - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, with a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0…100% RH) and the temperature (–35…+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). The on-wall sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFTF - Modbus - T3



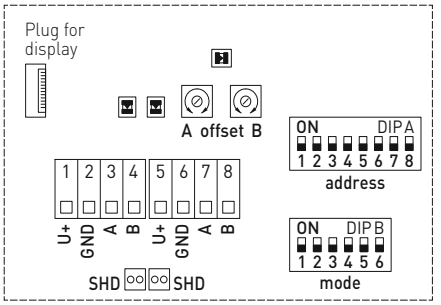
Device version with **M12 connector** (optional on request)



TECHNICAL DATA

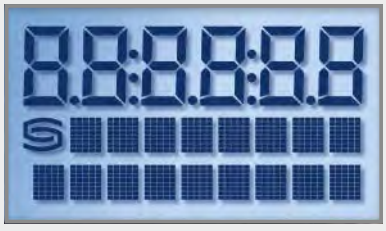
Voltage supply:	24 V AC (± 20 %); 15…36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Protective tube:	**stainless steel V2A** (1.4301), Ø 13 mm, NL = 46 mm
Sensor protection:	**plastic** sinter filter, Ø 13 mm, L = 28 mm
Measuring range:	0…100 % RH (humidity) –35…+80 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20…80 % RH) at +25 °C, otherwise ± 3.0 %
Temperature deviation:	typically ± 0.4 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 5 °C (temperature)
Ambient temperature:	–30…+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),, housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**

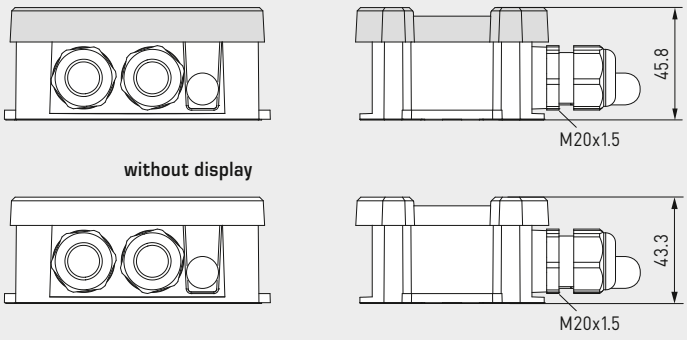


On-wall-humidity- and temperature sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

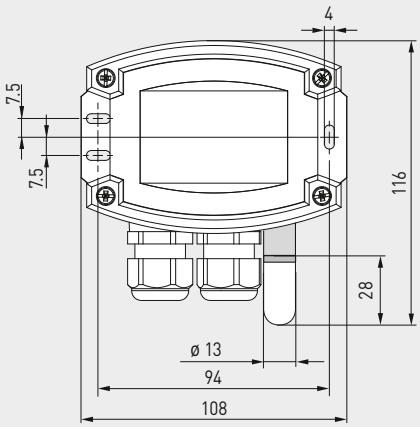
Dimensional drawing [mm]

AFTF-Modbus-T3

with display



without display





SF-14-K
Plastic sinter filter exchangeable

AFTF-Modbus-T3
with display



SI IMP

WS-04
Weather and sun protection hood (optional)







HYGRASGARD® AFTF-Modbus-T3 On-wall-humidity- and temperature sensors (± 2.0 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)		Temperature	Output	Display	Item No.	Price
AFTF-Modbus-T3							
AFTF-Modbus-T3	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	Modbus		1201-12C6-1000-000	**217,43 €**
AFTF-Modbus-T3 **LCD**	(5 x as above)		(1 x as above)	Modbus	■	1201-12C6-1400-000	**274,09 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).						
ACCESSORIES							
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection					1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**82,20 €**
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)					7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)					7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!						

HYGRASGARD® KFTF (20) - Modbus - T3
HYGRASGARD® KFTF (20) - wModbus

Duct humidity- and temperature sensors (± 1.8 % / ± 2.0 %), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

Calibratable duct humidity and temperature sensor **HYGR**ASGARD® **KFTF-Modbus-T3** (± 2.0%) or **KFTF-20-Modbus-T3** (± 1.8%), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, with a plastic sinter filter (exchangeable), incl. mounting flange, to exactly detect the relative humidity (0...100% RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The duct sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

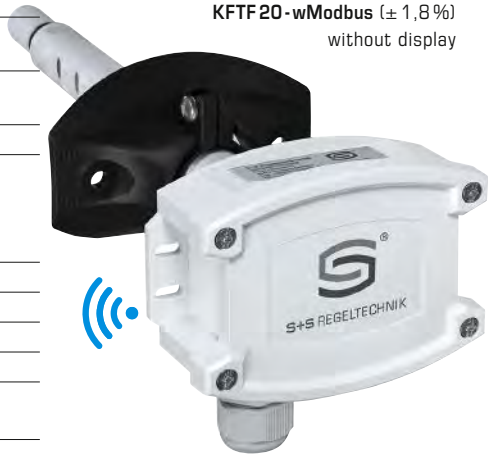
A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in de-energised state, internal LEDs for telegram status indication, Push terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

KFTF-Modbus-T3 (± 2,0 %)
KFTF 20-Modbus-T3 (± 1,8 %)
without display



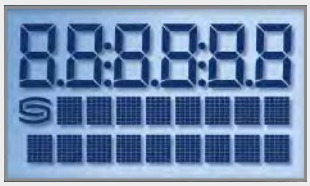
KFTF-wModbus (± 2,0 %)
KFTF 20-wModbus (± 1,8 %)
without display



TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	0...100 % RH (humidity); –35...+80 °C (temperature)
Deviation, humidity:	**KFTF-Modbus** / **KFTF-wModbus**: typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **KFTF 20-Modbus** / **KFTF 20- wModbus**: typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	**Modbus RTU** (RS485 interface for RTU cable) **or W-Modbus** (Wireless Modbus with 2.4 GHz ISM)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud (with RTU cable)
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (M 20 x 1,5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (optionally made of stainless steel **V2A** (1.4301), Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU, Radio Directive ETSI 300 328 V2.2.2
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Programmable display screen **Tyr 3**



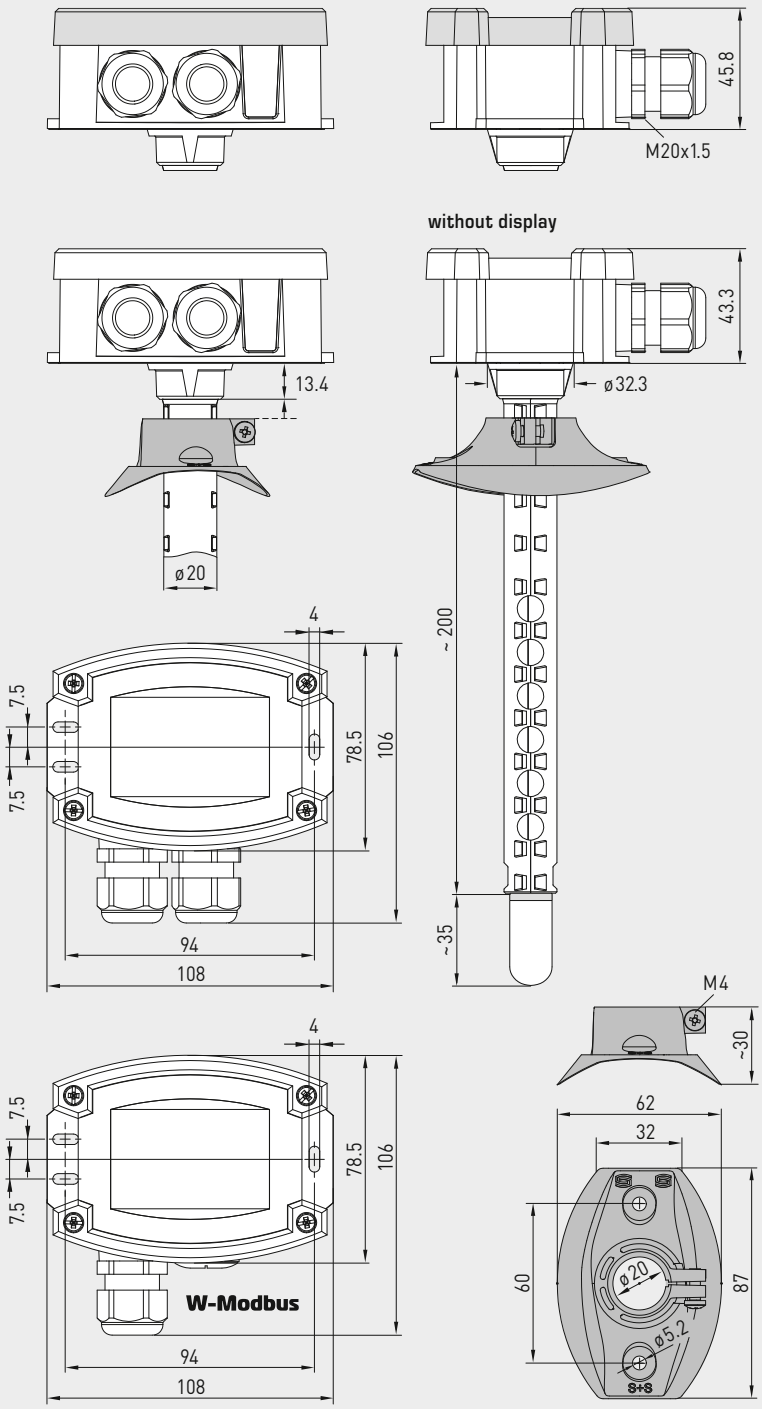
S+S REGELTECHNIK

NEW

HYGRASGARD® KFTF (20)-Modbus-T3
HYGRASGARD® KFTF (20)-wModbus

Duct humidity- and temperature sensors (± 1.8 % / ± 2.0 %), incl. mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing
(mm)



KFTF-Modbus-T3 (± 2,0 %)
KFTF20-Modbus-T3 (± 1,8 %)
with display



KFTF-wModbus (± 2,0 %)
KFTF20-wModbus (± 1,8 %)
with display



Device version
with **M12 connector**
(optional on request)



MFT-20-K
Mounting flange,
plastic



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

stainless steel protective tube
(optional on request)



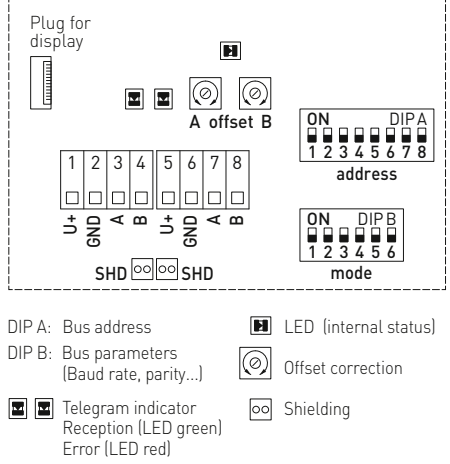
HYGRASGARD® KFTF (20) - Modbus - T3
HYGRASGARD® KFTF (20) - wModbus

Duct humidity- and temperature sensors (± 1.8 % / ± 2.0 %), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Modbus W-Modbus

S+S REGELTECHNIK

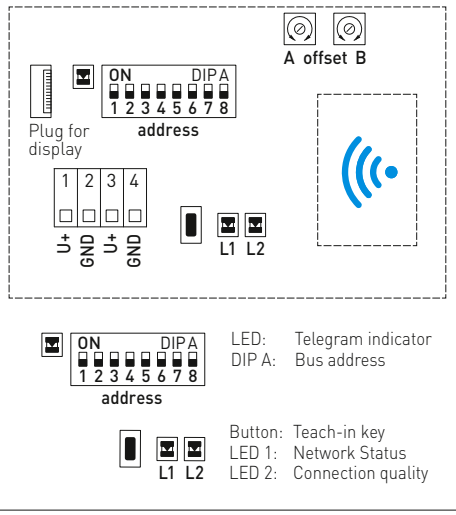
Schematic diagram (Tyr3) **Modbus** (RTU cable)



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding



Schematic diagram (Tyr3) **W-Modbus** (Wireless)



LED: Telegram indicator
DIP A: Bus address

Button: Teach-in key
LED 1: Network Status
LED 2: Connection quality



ACCESSORIES			
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel I **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable (included in the scope of delivery)	7000-0050-2310-000	**13,25 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)	7100-0030-4000-000	**9,85 €**
	For further information, see last chapter Accessories!		
MODBUS ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
GW-wModbus	**Gateway** with W-Modbus module, for radio-based connection to Modbus networks	1801-1211-1101-000	**229,00 €**
	For further information see the end of the chapter!		

NEW

HYGRASGARD® KFTF (20) - Modbus - T3
HYGRASGARD® KFTF (20) - wModbus

Duct humidity- and temperature sensors (± 1.8 % / ± 2.0 %), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

HYGRASGARD® **KFTF - Modbus - T3**
HYGRASGARD® **KFTF 20 - Modbus - T3**
with/without display



HYGRASGARD® **KFTF - wModbus**
HYGRASGARD® **KFTF 20 - wModbus**
with/without display



HYGRASGARD® **KFTF (20) - Modbus - T3** **KFTF (20) - wModbus**	Duct humidity- and temperature sensors (± 1,8 % / ± 2,0 %) with with Modbus connection (RTU cable) or with W-Modbus (Wireless)						
Type / WG01	**Measuring Range / Readout** Humidity (switchable)		Temperature	**Output**	**Display**	**Item No.**	**Price**
Accuracy	**± 2,0 % RH**						
KFTF-Modbus-T3	0 ... 100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg 0...+50 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	Modbus		1201-32C6-1000-029	**215,41 €**
KFTF-Modbus-T3 **LCD**	(5 x as above)		(1 x as above)	Modbus	■	1201-32C6-1400-029	**272,06 €**
KFTF-wModbus	(5 x as above)		(1 x as above)	W-Modbus		1201-32CF-1000-029	**255,41 €**
KFTF-wModbus **LCD**	(5 x as above)		(1 x as above)	W-Modbus	■	1201-32CF-1400-029	**312,06 €**
Accuracy	**± 1,8 % RH**						
KFTF-20-Modbus-T3	0 ...100 % RH 0 ... 80 g / kg 0 ... 80 g / m³ 0 ... 85 kJ / kg 0...+50 °C	(default) (MV) (a.F.) (ENT.) (TP)	–35...+80 °C	Modbus		1201-32C6-1000-030	**281,59 €**
KFTF-20-Modbus-T3 **LCD**	(5 x as above)		(1 x as above)	Modbus	■	1201-32C6-1400-030	**424,24 €**
KFTF-20-wModbus	(5 x as above)		(1 x as above)	W-Modbus		1201-32CF-1000-030	**321,59 €**
KFTF-20-wModbus **LCD**	(5 x as above)		(1 x as above)	W-Modbus	■	1201-32CF-1400-030	**464,24 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm Protective tube made of stainless steel					on request on request on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).						

HYGRASGARD® RPFTF-Modbus-T3
HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Modbus

S+S REGELTECHNIK

Calibratable room pendulum humidity and temperature sensor **HYGR**ASGARD® **RPFTF-Modbus-T3** (± 2,0 %) or RPFTF-**20-Modbus-T3** (± 1,8 %), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with a stainless steel pendulum and a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100 % RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The pendulum sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	0...100 % RH (humidity); –35...+80 °C (temperature)
Deviation, humidity:	**RFTF-Modbus:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **RFTF-20-Modbus:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),, housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 6 x 0.14 mm², KL = approx. 2 m (other lengths optional)
Protective tube:	stainless steel **V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

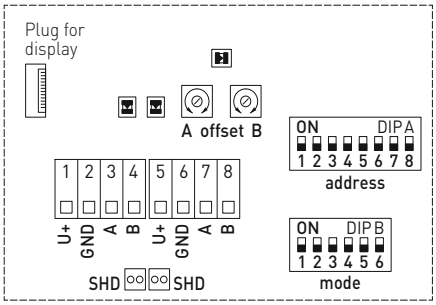
RPFTF-Modbus-T3 (± 2,0 %)
RPFTF-20-Modbus-T3 (± 1,8 %)



Device version with **M12 connector** (optional on request)

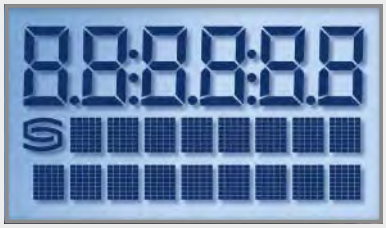


Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**

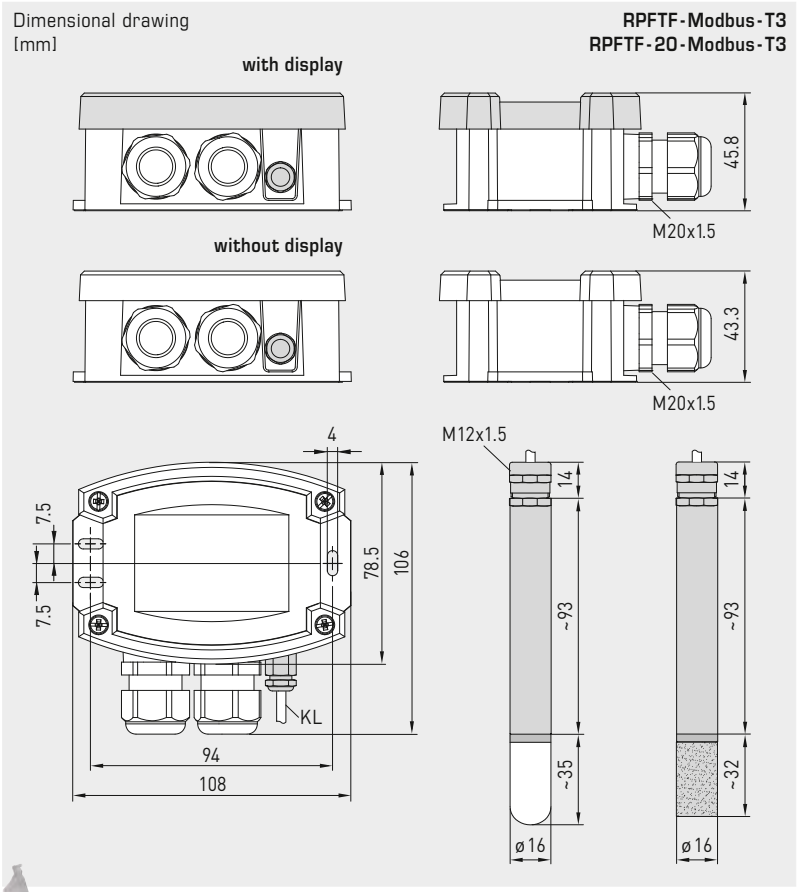


HYGRASGARD® RPFTF-Modbus-T3
HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing [mm]

RPFTF-Modbus-T3
RPFTF-20-Modbus-T3



RPFTF-Modbus-T3 (± 2,0 %)
RPFTF-20-Modbus-T3 (± 1,8 %)
with display



MF-16-K
Mounting flange, plastic (optional)







SF-K
plastic sinter filter (standard)



SF-M
metal sinter filter (optional)



HYGRASGARD® RPFTF-Modbus-T3 Pendulum room humidity and temperature sensors (± 2.0 %)
HYGRASGARD® RPFTF-20-Modbus-T3 Pendulum room humidity and temperature sensors (± 1.8 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RPFTF-Modbus-T3					**(± 2,0 %)**	
RPFTF-Modbus-T3	0 ... 100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-6246-1000-000	**305,21 €**
RPFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-000	**392,80 €**
RPFTF-20-Modbus-T3					**(± 1,8 %)**	
RPFTF-20-Modbus-T3	(5 x as above)	(1 x as above)	Modbus		1201-6246-1000-001	**397,38 €**
RPFTF-20-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-001	**454,30 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)				7000-0050-2200-100	**43,60 €**
MF-16-K	**Mounting flange** plastic (optional)				7100-0030-0000-000	**9,85 €**

HYGRASGARD® VFTF-Modbus-T3

Showcase humidity and temperature sensor (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Calibratable display cases humidity and temperature sensor **HYGR**ASGARD® **VFTF-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with a flat stainless steel probe (pluggable), to exactly detect the relative humidity (0...100% RH) and the temperature (–35...+80 °C) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The display cases sensor is applied in a non-aggressive, dust-free environment and is specially suitable for installation in ceilings, walls, display cases or showcases. It is used in museums, galleries, cinemas, lecture halls or laboratories.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); –35...+80 °C (temperature)
Deviation, humidity:	**± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 4 x 0.14 mm², KL = approx. 2 m (other lengths optional)
Sensor protection:	**probe** made of stainless steel, **V4A** (1.4571), **pluggable**; sensor head Ø = 17 mm, H = approx. 2.5 mm; protective sleeve Ø = 10 mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector Ø = approx. 11 mm, NL = approx. 25 mm
Mounting (sensor):	cut-out Ø = 11 - 15 mm, (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

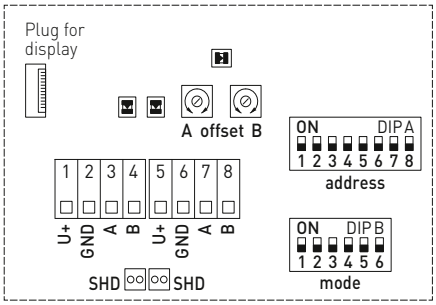
VFTF-Modbus-T3



Device version with **M12 connector** (optional on request)

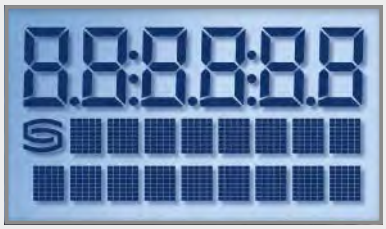


Schematic diagram **Modbus Tyr 3**



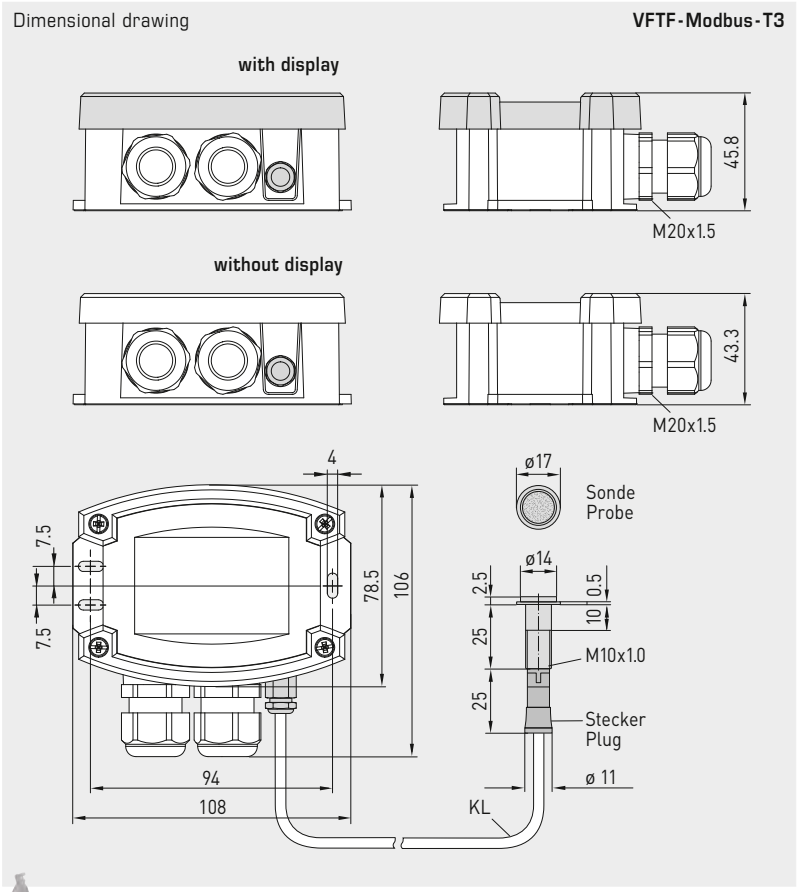
DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

Programmable display screen **Modbus Tyr 3**



Showcase humidity and temperature sensor (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing **VFTF-Modbus-T3**



VFTF-Modbus-T3
with display







Probe
made of stainless steel, pluggable



HYGRASGARD® VFTF-Modbus-T3 Showcase humidity and temperature sensor (± 2.0 %), *Premium*						
Type / WG01	**Measuring Range / Readout** Humidity (switchable)	Temperature	**Output**	**Display**	**Item no.**	**Price**
VFTF-Modbus-T3						
VFTF-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-6256-1000-000	**556,65 €**
VFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6256-1400-000	**616,72 €**
Extra charge:	**cable length** (KL = approx. 2 m), other lengths optional Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**82,20 €**

HYGRASGARD® TW - Modbus - T3

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

Calibratable dew point control switch **HYGR**ASGARD® **TW-Modbus-T3** (compact variant incl. strap) or **TW-Modbus-external** (detached variant), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, to exactly detect the relative humidity (0…100 % RH) and the temperature (–35…+80 °C) and to detect various parameters in humidity measurement.
The dew formation in particular is reliably determined thanks to its patented measuring method, the **pro-dynamic cross-convection** (no conductivity measurement).
International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

The surface-contact sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in curent-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TW-Modbus-T3
(compact variant)



Device version
with **M12 connector**
(optional on request)



TW-extern-Modbus-T3
(detached variant)



TECHNICAL DATA

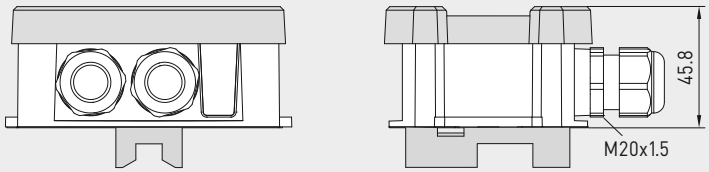
Voltage supply:	24 V AC (± 20 %); 15…36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0…100 % RH (humidity); –35…+80 °C (temperature)
Deviation, humidity:	**± 2.0** % (20…80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity); ± 5 °C (temperature)
Ambient temperature:	–30…+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Prozessanschluss:	endless strap with metal tightener, 300 mm, for pipes up to 3 '''
Sensor protection:	membrane filter
Mounting:	**TW-Modbus** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **TW-Modbus-external** with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Features:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

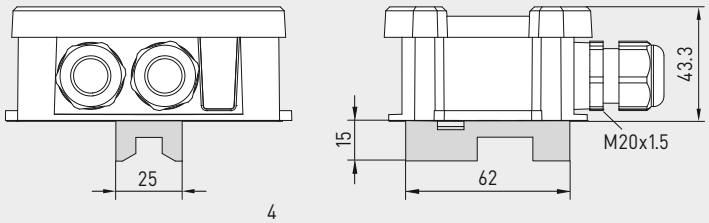
Dimensional drawing
[mm]

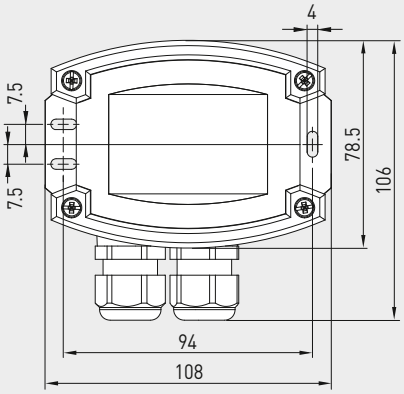
TW-Modbus-T3

with display



without display





PATENTED



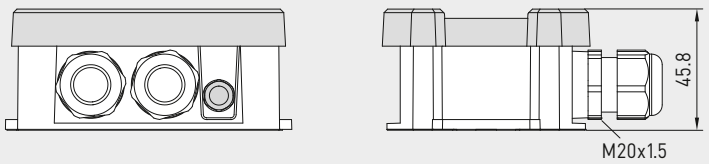
TW-Modbus-T3
(compact variant)
with display



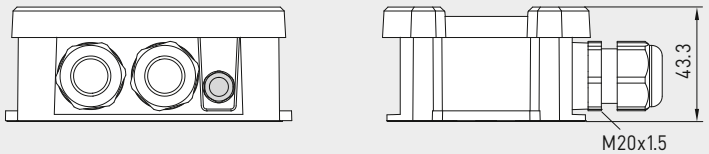
Dimensional drawing
[mm]

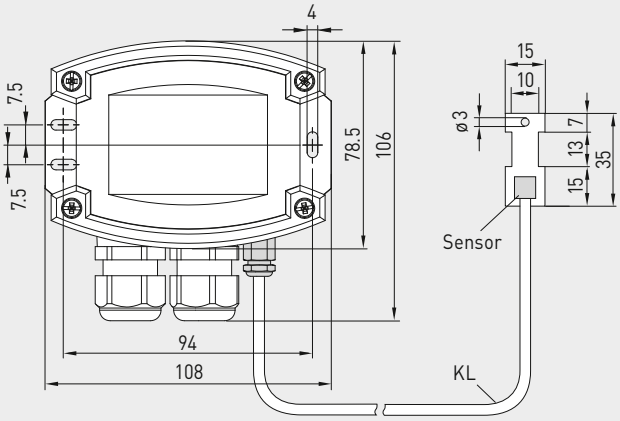
TW-extern-Modbus-T3

with display



without display





TW-extern-Modbus-T3
(detached variant)
with display



HYGRASGARD® TW - Modbus - T3

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

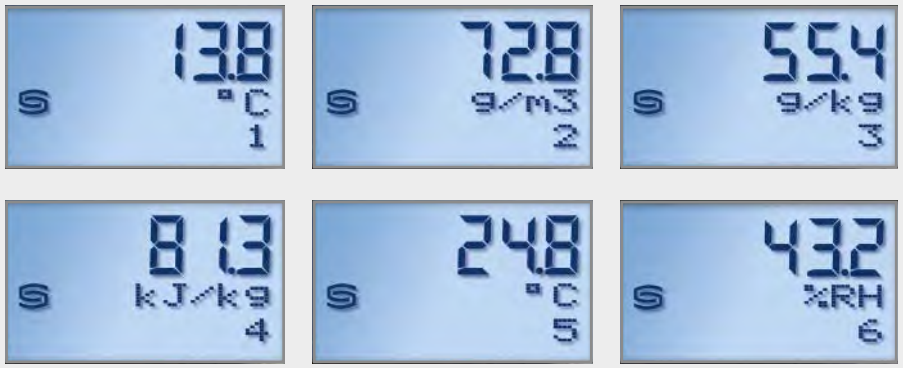
S+S REGELTECHNIK

Display screen (cyclic)
standard



Display screen (static)
alternative output variables

HYGRASGARD® Modbus-T3

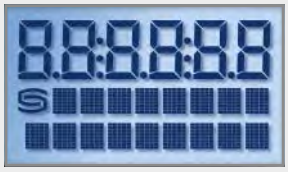


The display value depends on the set **unit system.**
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface can be used to program an **alternative output variable** instead of the standard display.
In this case, the first line indicates the value while the second line indicates the corresponding unit **statically**.
The index in the third line indicates the display type:

Index 1 = dew point
Index 2 = absolute humidity
Index 3 = mixture ratio
Index 4 = enthalpy
Index 5 = temperature
Index 6 = relative humidity

Programmable display screen
Modbus Tyr 3



The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

SI IMP



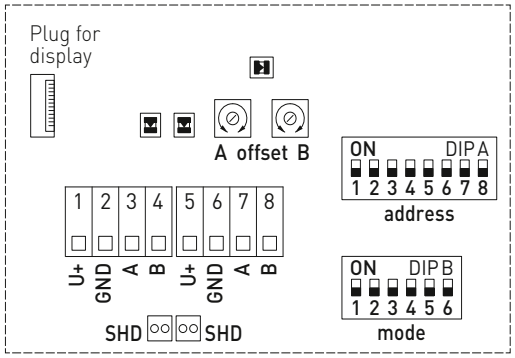
Switchable system of units

Measured values / data points			
	SI (default)	→	**Imperial**
Temperature	[°C]	→	[°F]
Humidity	[% RH]	→	[% RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixing ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]

Measuring ranges		
SI (default)	→	**Imperial**
–35…+80 °C		–3…+176 °F
0…100 % RH		0…100 % RH
Alternative parameters are calculated.		

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Schematic diagram **Modbus Tyr 3**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Shielding

TW-Modbus-T3
with display





HYGRASGARD® TW-Modbus-T3 Dew point control switches, incl. strap (± 2.0 %)
HYGRASGARD® TW-external-Modbus-T3 Dew point control switches, with detached sensor head (± 2.0 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
TW-Modbus-T3						
TW-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m³ (A.H.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (DP)	–35...+80 °C	Modbus		1201-1281-3001-020	**196,17 €**
TW-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-1281-3401-020	**252,61 €**
TW-external-Modbus-T3						
TW-extern-Modbus-T3	0 ...100 % RH (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m³ (A.H.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (DP)	–35...+80 °C	Modbus		1201-1281-3001-030	**214,63 €**
TW-extern-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-1281-3401-030	**256,50 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**82,20 €**

PREMASGARD® 232x - Modbus - T3
PREMASGARD® 232x - wModbus

Pressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection or W-Modbus (wireless)

Modbus
W-Modbus

S+S REGELTECHNIK

Maintenance-free pressure sensor **PREM**ASGARD® **232x-Modbus-T3** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland (optionally M12 connector according to DIN EN 61076-2-101), optionally with/without display, for measuring the differential pressure (max. 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws). With **wModbus** device version, the W-Modbus (wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in de-energised state, internal LEDs for telegram status indication, Push terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **232x-Modbus-T3**
without display



PREMASGARD® **232x-wModbus**
without display

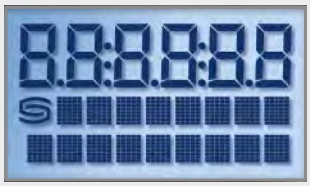


Device version
with **M12 connector**
(optional on request)



Programmable
display screen

Tyr 3



TECHNICAL DATA

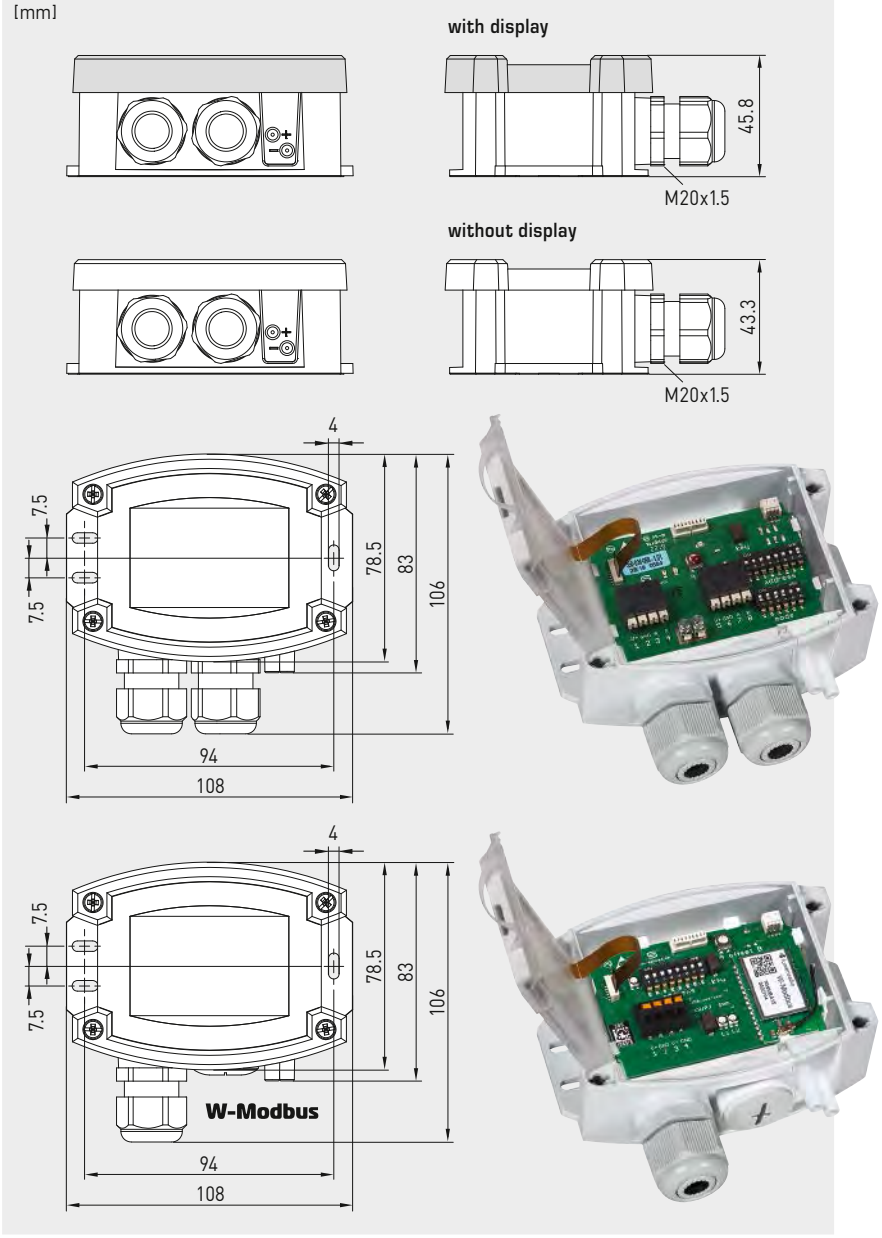
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWC]
Pressure type:	Differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm
Measuring range, pressure:	**–500**... **+500 Pa** or **–7000**...**+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 2328** (500 Pa): typical ± 3 Pa at +25 °C **Type 2327** (7000 Pa): typical ± 35 Pa at +25 °C compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 5 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Communication:	**Modbus RTU** (RS485 interface for RTU cable) **or** **W-Modbus** (Wireless Modbus with 2.4 GHz ISM)
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud (with RTU cable)
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Permissible humidity:	< 95 % RH, (non-precipitating air)
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326, EMC directive 2014 / 30 / EU, Radio Directive ETSI 300 328 V2.2.2
Optional:	three-line **display with illumination,** programmable, cut-out approx. 51 x 29 mm (W x H), to display the actual pressure or an individually programmable display value

NEW

PREMASGARD® 232x - Modbus - T3
PREMASGARD® 232x - wModbus

Pressure and differential pressure measuring transducers, incl. connection set, with Modbus connection or W-Modbus (wireless)

Dimensional drawing
(mm)



PREMASGARD® 232x - Modbus - T3
with display

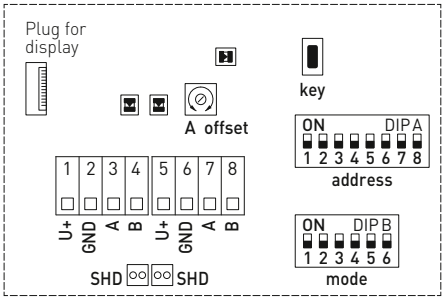


PREMASGARD® 232x - wModbus
with display



Schematic diagram
(Tyr3)

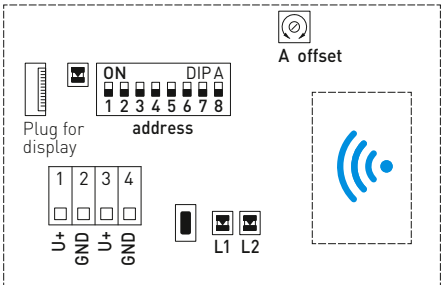
Modbus
(RTU cable)

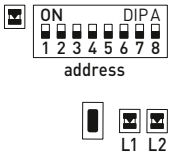


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Schematic diagram
(Tyr3)

W-Modbus
(Wireless)





LED: Telegram indicator
DIP A: Bus address

Button: Teach-in key
LED 1: Network Status
LED 2: Connection quality

WS-04
Weather and sun protection hood
(optional)



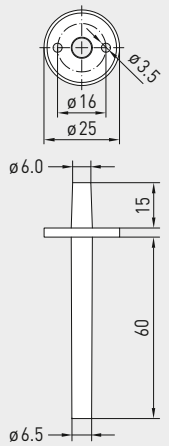
PREMASGARD® 232x - Modbus - T3
PREMASGARD® 232x - wModbus

**Pressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection or W-Modbus (wireless)**

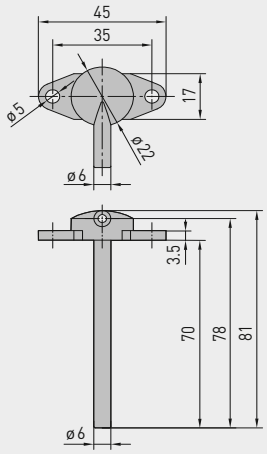
Modbus
W-Modbus

S+S REGELTECHNIK

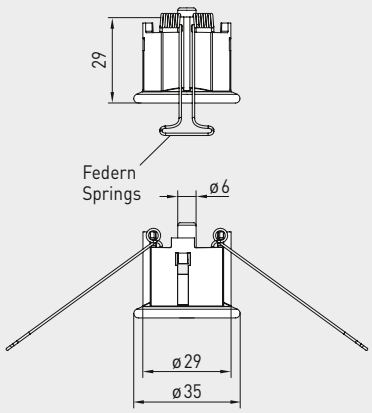
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



ACCESSORIES

ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information, see chapter Accessories!		

MODBUS ACCESSORIES

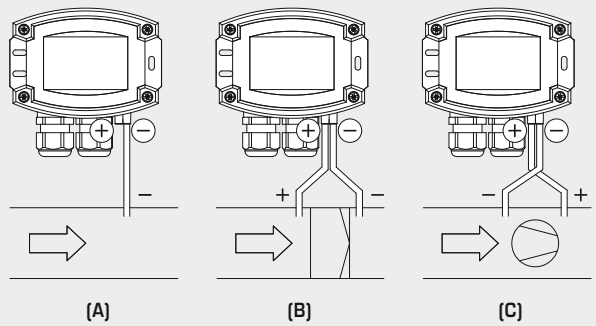
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
GW-wModbus	**Gateway** with W-Modbus module, for radio-based connection to Modbus networks	1801-1211-1101-000	**229,00 €**
	For further information see the end of the chapter!		

NEW

PREMASGARD® 232x-Modbus-T3
PREMASGARD® 232x-wModbus

Pressure and differential pressure measuring transducers, incl. connection set, with Modbus connection or W-Modbus (wireless)

Mounting diagram — **PREM**ASGARD® **232x-Modbus-T3**



TYPES OF MONITORING

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Switchable system of units

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]

Measuring ranges	SI (default)	→	Imperial
Type 2328	–500…+500 Pa	→	–2.0…+2.0 inWC
Type 2327	–7000…+7000 Pa	→	–28…+28 inWC



PREMASGARD® **232x-wModbus**
with/without display



PREMASGARD® **232x-Modbus-T3**
with/without display

PREMASGARD® **232x-Modbus-T3** **232x-wModbus**	Pressure sensor, differential pressure measuring transducer with with Modbus connection (RTU cable) or with W-Modbus (Wireless)				
Measuring Range Pressure	**Type / WG02**	**Output**	**Display**	**Item No.**	**Price**
± 500 Pa	**Type 2328**				
– 500 … + 500 Pa	PREMASGARD 2328-Modbus	Modbus		1301-12C4-0910-200	**208,96 €**
	PREMASGARD 2328-Modbus **LCD**	Modbus	■	1301-12C4-4910-200	**262,89 €**
	PREMASGARD 2328-wModbus	W-Modbus		1301-12CF-0910-200	**248,96 €**
	PREMASGARD 2328-wModbus **LCD**	W-Modbus	■	1301-12CF-4910-200	**302,89 €**
± 7000 Pa	**Type 2327**				
– 7000 … + 7000 Pa	PREMASGARD 2327-Modbus	Modbus		1301-12C4-0950-200	**208,96 €**
	PREMASGARD 2327-Modbus **LCD**	Modbus	■	1301-12C4-4950-200	**262,89 €**
	PREMASGARD 2327-wModbus	W-Modbus		1301-12CF-0950-200	**248,96 €**
	PREMASGARD 2327-wModbus **LCD**	W-Modbus	■	1301-12CF-4950-200	**302,89 €**
Optional:	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Note:	System of units **SI** (default) or **Imperial** (switchable via Modbus).				

Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Maintenance-free, microprocessor-controlled **PREM**ASGARD® **714x - Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (max. ± 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **714x - Modbus**



Device version with **M12 connector** (optional)



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWC], Volume flow [m³/h] [CFM]
Pressure type:	Differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm (optional on request with **quick** connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	**–500**... **+500 Pa** or **–7000**...**+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 7148** (500 Pa): typical ± 13 Pa **Type 7147** (7000 Pa): typical ± 105 Pa compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Ambient temperature:	–30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland** plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
ACCESSORIES	see table
ASD-06	**Connection set** (nipple straight) (included in the scope of delivery)

Display screen (SI or Imperial) **Modbus Tyr 2**



Pressure [Pa] [inWC]



Volume flow rate [m³/h] [CFM]

Programmable display screen **Modbus Tyr 2**

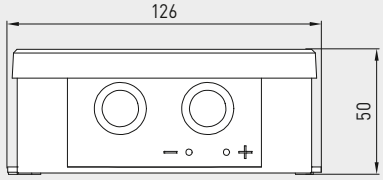


S+S REGELTECHNIK

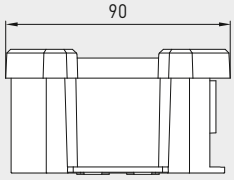
Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Dimensional drawing
[mm]

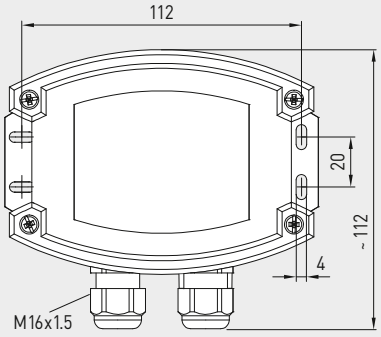
PREMASGARD® **714x - Modbus**

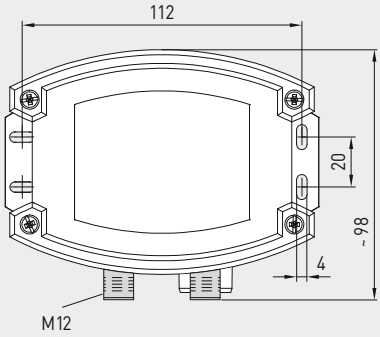


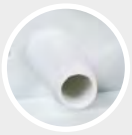
Housing with
pressure port nozzles
and **cable gland**



Housing with
pressure port nozzles
and **M12 connector**







Pressure port
for pressure hose



M12 connector
(male)

PREMASGARD® **714x - Modbus**
with display

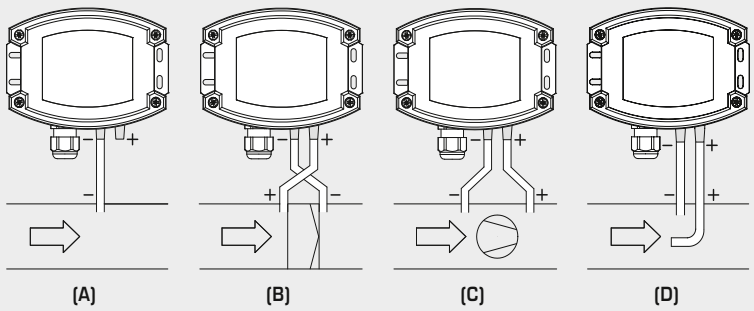


Device version
with **cable gland**
(as standard)



Mounting diagram

PREMASGARD® **714x - Modbus**



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected,
but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure,
connected in flow direction
P2 (–) static pressure, connected free of
dynamic pressure components

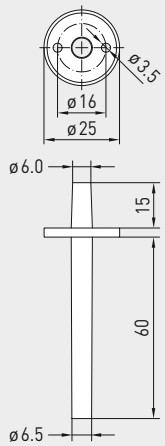
Switchable system of units

Measurements / Data points	**SI** (default)	→	**Imperial**
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]

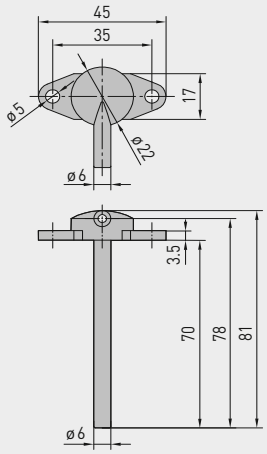
Measuring ranges	**SI** (default)	→	**Imperial**
Type 7148	–500...+500 Pa	→	–2.0...+2.0 inWC
Type 7147	–7000...+7000 Pa	→	–28...+28 inWC

Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

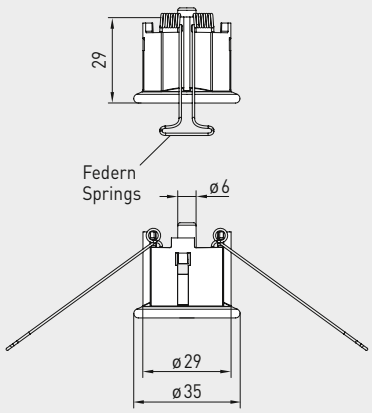
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





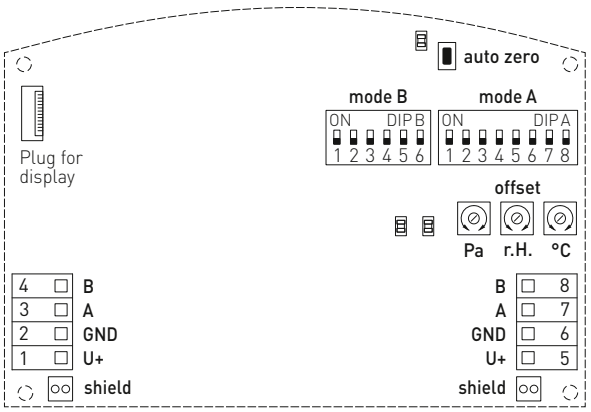
WS-03
Weather and sun protection hood (optional)

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see chapter Accessories!		

S+S REGELTECHNIK

Pressure sensor and measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Schematic diagram **PREMASGARD® 714x - Modbus**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Reset button
Offset correction
Shielding

PREMASGARD® 714x - Modbus with display







PREMASGARD® 714x - Modbus		Pressure sensor and measuring transducer for differential pressure and volume flow, *Deluxe*				
Measuring Range Pressure / Volume Flow		**Type / WG02**	**Output**	**Display**	**Item no.**	**Price**
± 500 Pa		**Type 7148**				
– 500 ... + 500 Pa	44721 m³/h (k = 2000)	PREMASGARD 7148-Modbus	Modbus		1301-7164-0910-20V	**419,32 €**
		PREMASGARD 7148-Modbus **LCD**	Modbus	■	1301-7164-4910-20V	**466,04 €**
		with automatic zero-point calibration as standard				
± 7000 Pa		**Type 7147**				
– 7000 ... + 7000 Pa	167332 m³/h (k = 2000)	PREMASGARD 7147-Modbus	Modbus		1301-7164-0950-200	**360,92 €**
		PREMASGARD 7147-Modbus **LCD**	Modbus	■	1301-7164-4950-200	**407,64 €**
		with optional automatic zero point calibration (Please specify in your order)			Extra charge	**74,74 €**
Optional:		Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Note:		System of units **SI** (default) or **Imperial** (switchable via Modbus).				

PREMASGARD® 724x - Modbus

Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

Maintenance-free, microprocessor-controlled **PREM**ASGARD® **724x - Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (2 measuring channels, max. ± 7000 Pa) in air. Type variant **724xT** with connection facility for external **Pt1000** sensor (sensor element not included in the scope of delivery) for detecting the temperature (–50...+150°C). International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow and temperature.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **724x - Modbus**
with cable gland



PREMASGARD® **724x - Modbus - Q**
with M12 connector





TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F] – **Type 724xT** with connection facility for external **Pt1000** sensor (–50...+150°C) (sensor element not included in the scope of delivery)
Pressure type:	differential pressure (**2 measuring channels**)
Pressure connection:	with connection **nozzles** for pressure hose Ø 6 mm
Measuring range, pressure:	**–500**... **+500 Pa** or **–7000**...**+7000 Pa** depending on the device type, see table
Pressure accuracy:	**Type 724x** (500 Pa): typically ± 1 3 Pa at +25 °C **Type 724x** (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Ambient temperature:	–30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland** plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
ACCESSORIES	see table

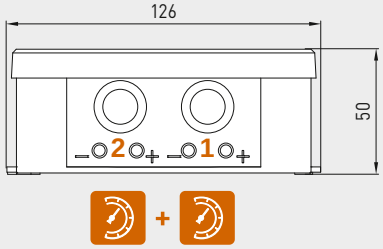
PREMASGARD® **724xT - Modbus**
with cable gland

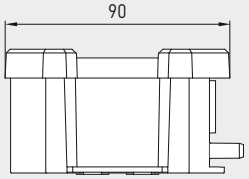


Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

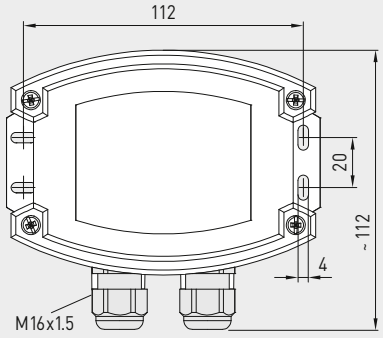
Dimensional drawing
[mm]

PREMASGARD® 724x-Modbus



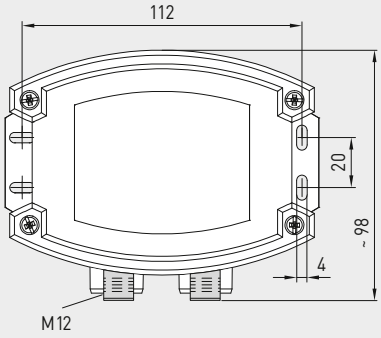


Housing with
dual pressure connection
(2 measuring channels)
and **cable gland**





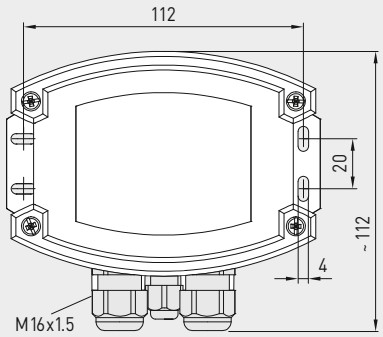
Housing with
dual pressure connection
(2 measuring channels)
and **M12 connector** (male)



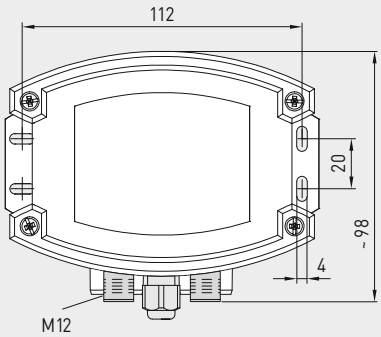


Dimensional drawing
[mm]

PREMASGARD® 724xT-Modbus
with connection facility
for external **Pt1000** sensor









PREMASGARD® 724x-Modbus
with cable gland
and display



PREMASGARD® 724x-Modbus-Q
with M12 connector
and display





PREMASGARD® 724xT-Modbus
with cable gland
and display

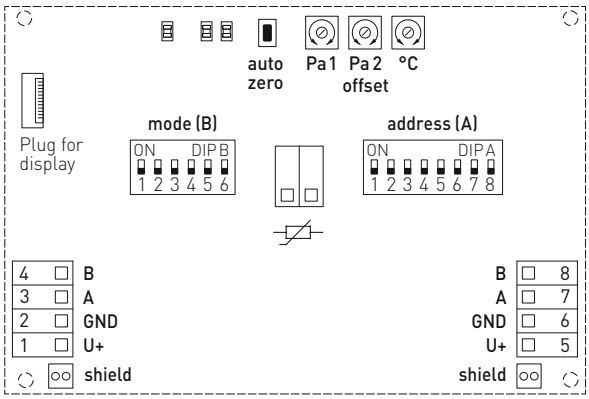


PREMASGARD® 724x-Modbus

**Dual pressure sensor (2 measuring channels),
measuring transducer for differential pressure and volume flow,
incl. connection set, calibratable, with Modbus connection**

S+S REGELTECHNIK

Schematic diagram — **PREMASGARD® 724x-Modbus**

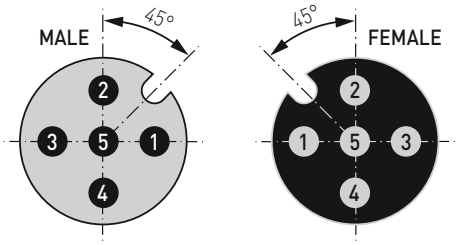


DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)

Telegram indicator
Reception (LED green)
Error (LED red)

LED (internal status)
Reset button
Offset correction
Shielding

Pin assignment (M12) — **PREMASGARD® 724x-Modbus**



1 +UB
2 Modbus A
3 –UB GND
4 Modbus B
5 Shield

Display screen (SI or Imperial) — **PREMASGARD® 724x-Modbus**



Pressure (channel 1) [Pa] [inWC]



Volume flow rate [m³/h] [CFM]



Pressure (channel 2) [Pa] [inWC]



Temperature (type "**T**") [°C] [°F]

The display value depends on the set **unit system SI** (default) or **imperial** (can be changed via Modbus.

Actual **pressure** of both channels is shown alternately.
The associated measuring channel is visible at the bottom left.

Alternatively, the calculated **volume flow** can also be issued for channel 1 (via the index).

For the device type "**T**", the actual **temperature** of an external **Pt1000** temperature sensor can also be displayed as cyclic (standard) or static (via the index).

Programmable display screen — **Modbus Tyr 2**



Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

PREMASGARD® **724x-Modbus**
with display

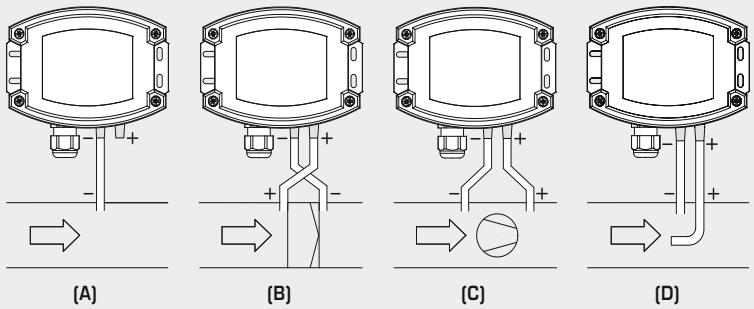






Mounting diagram

PREMASGARD® **724x-Modbus**



TYPES OF MONITORING:
Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

Switchable system of units

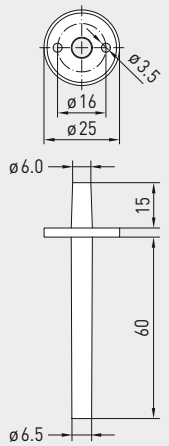
Measurements / Data points	**SI** (default)	→	**Imperial**
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m^3/h]	→	[CFM]
Temperature	[°C]	→	[°F]

Measuring ranges	**SI** (default)	→	**Imperial**
Type 724x	–500…+500 Pa	→	–2.0…+2.0 inWC
Type 724x	–7000…+7000 Pa	→	–28…+28 inWC
Type 724xT	–50…+150 °C	→	–58…+302 °F

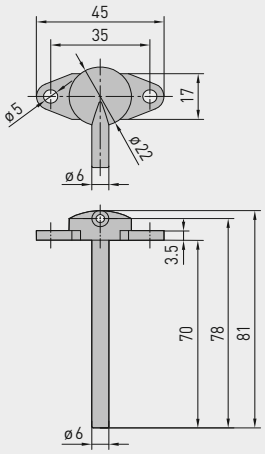
Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

S+S REGELTECHNIK

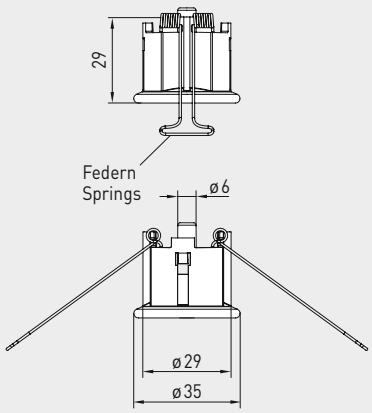
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
ASD-06	**Connection set** (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see chapter Accessories!		

Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, incl. connection set, calibratable, with Modbus connection

PREMASGARD® **724xT - Modbus**
with cable gland
or M12 connector
and connection facility for **Pt1000**



SI IMP

PREMASGARD® **724x - Modbus**
with cable gland
or M12 connector



PREMASGARD® **724x - Modbus**		Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, *Deluxe*				
Measuring Range Pressure / Volume Flow		**Type / WG02**	**Output**	**Display ● = Q**	**Item No.**	**Price**
(1) max. ± 500 Pa **(2) max. ± 500 Pa**		**Type 7245**				
Channel (1) and (2): – 500 … + 500 Pa	44721 m³/h (k = 2000)	PREMASGARD 7245-Modbus	Modbus		1301-7224-0910-200	**262,80 €**
		PREMASGARD 7245-Modbus LCD	Modbus	■	1301-7224-4910-200	**313,03 €**
		PREMASGARD 7245**T**-Modbus	Modbus		1301-7224-0910-2W0	**297,85 €**
		PREMASGARD 7245**T**-Modbus LCD	Modbus	■	1301-7224-4910-2W0	**348,07 €**
		PREMASGARD 7245-Modbus **Q**	Modbus	●	2004-6331-6100-021	**342,23 €**
		PREMASGARD 7245-Modbus **Q** LCD	Modbus	● ■	2004-6332-6100-021	**392,45 €**
		PREMASGARD 7245**T**-Modbus **Q**	Modbus	●	2005-6331-6100-021	**377,27 €**
		PREMASGARD 7245**T**-Modbus **Q** LCD	Modbus	● ■	2005-6332-6100-021	**427,49 €**
(1) max. ± 7000 Pa **(2) max. ± 7000 Pa**		**Type 7247**				
Channel (1) and (2): – 7000 … + 7000 Pa	167332 m³/h (k = 2000)	PREMASGARD 7247-Modbus	Modbus		1301-7224-0950-200	**262,80 €**
		PREMASGARD 7247-Modbus LCD	Modbus	■	1301-7224-4950-200	**313,03 €**
		PREMASGARD 7247**T**-Modbus	Modbus		1301-7224-0950-2W0	**297,85 €**
		PREMASGARD 7247**T**-Modbus LCD	Modbus	■	1301-7224-4950-2W0	**348,07 €**
		PREMASGARD 7247-Modbus **Q**	Modbus	●	2004-6331-6100-011	**342,23 €**
		PREMASGARD 7247-Modbus **Q** LCD	Modbus	● ■	2004-6332-6100-011	**392,45 €**
		PREMASGARD 7247**T**-Modbus **Q**	Modbus	●	2005-6331-6100-011	**377,27 €**
		PREMASGARD 7247**T**-Modbus **Q** LCD	Modbus	● ■	2005-6332-6100-011	**427,49 €**
(1) max. ± 500 Pa **(2) max. ± 7000 Pa**		**Type 7249**				
Channel (1): – 500 … + 500 Pa	44721 m³/h	PREMASGARD 7249-Modbus	Modbus		1301-7224-0930-200	**262,80 €**
		PREMASGARD 7249-Modbus LCD	Modbus	■	1301-7224-4930-200	**313,03 €**
Channel (2): – 7000 … + 7000 Pa	167332 m³/h (k = 2000)	PREMASGARD 7249**T**-Modbus	Modbus		1301-7224-0930-2W0	**297,85 €**
		PREMASGARD 7249**T**-Modbus LCD	Modbus	■	1301-7224-4930-2W0	**348,07 €**
		PREMASGARD 7249-Modbus **Q**	Modbus	●	2004-6331-6100-001	**342,23 €**
		PREMASGARD 7249-Modbus **Q** LCD	Modbus	● ■	2004-6332-6100-001	**392,45 €**
		PREMASGARD 7249**T**-Modbus **Q**	Modbus	●	2005-6331-6100-001	**377,27 €**
		PREMASGARD 7249**T**-Modbus **Q** LCD	Modbus	● ■	2005-6332-6100-001	**427,49 €**
Note:		System of units **SI** (default) or **Imperial** (switchable via Modbus).				
Housing variant "Q":		Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Housing variant "T":		Connection facility for external **Pt1000** sensor (–50…+150°C) (sensor element not included in the scope of delivery)				

PREMASGARD® 814x - Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

Modbus

S+S REGELTECHNIK

Maintenance-free microprocessor-controlled **PREM**ASGARD® **814x - Modbus** (Series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), plastic sinter filter (exchangeable), optionally with / without display, to exactly detect the relative humidity (0…100 % RH) and the temperature (–35…+80 °C) in ducts and to measure the differential pressure (max. ± 7000 Pa) in air. International system of units SI (default) can be switched to Imperial (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters.

A long-term stable, **digital humidity and temperature sensor** and a **pressure sensor** with piezoresistive measuring element guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: temperature, relative humidity, dew point, absolute humidity, mixture ratio, enthalpy (ignoring atmospheric air pressure), differential pressure, volume flow, air density.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **814x - Modbus**



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15…36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m^3/h] [CFM], temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m^3] [gr/ft^3], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], air density [kg/m^3] [lb/ft^3]
HUMIDITY & TEMPERATURE	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0…100 % RH
Operating range, humidity:	0…95 % RH (without dew formation)
Deviation in humidity:	typically **± 2.0** % (20…80 % RH) at +25 °C, otherwise ± 3.0 %
Measuring range, temperature:	–35…+80 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
PRESSURE	
Type of pressure:	differential pressure
Pressure connection:	with **connection nozzles** for pressure hose Ø 6 mm (optional on request with **quick** connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	**–500… +500 Pa** or **–7000…+7000 Pa** depending on the type of device, see table
Accuracy, pressure:	**Typ 8148** (500 Pa): typically ± 13 Pa at +25 °C **Typ 8147** (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % of final value
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, thermoset plastic, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20…+50 °C (temperature-compensated 0…+50 °C)

Continued on next page!

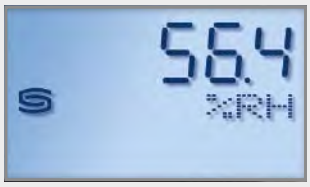
Display screen (SI or Imperial) — **Modbus Typ 2**



Pressure [Pa] [inWC]



Temperature [°C] [°F]



Humidity [% RH]



Volume flow rate [m^3/h] [CFM]

Programmable display screen — **Modbus Typ 2**

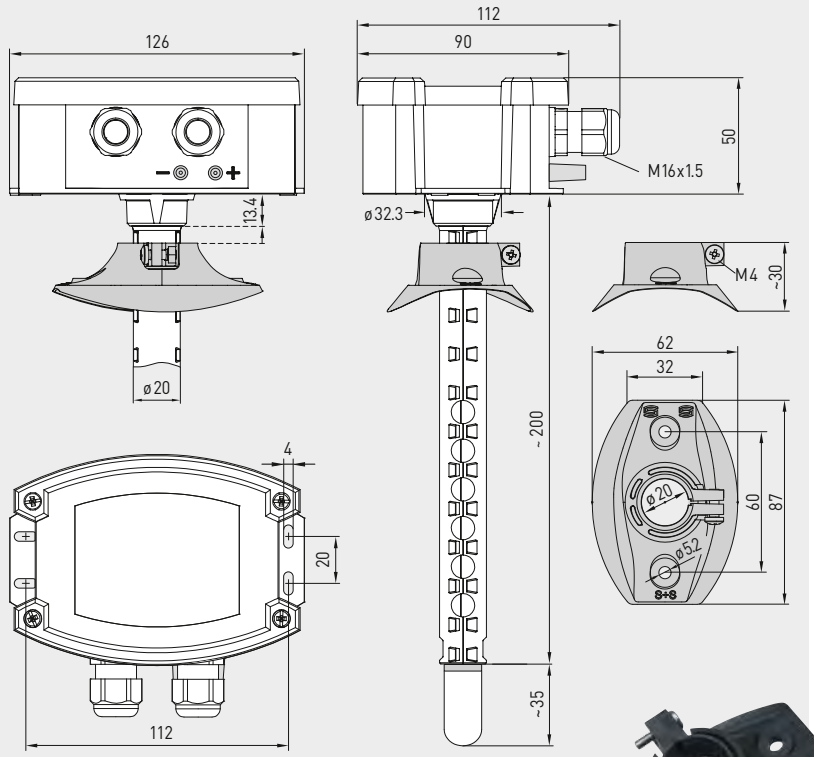


PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

Dimensional drawing [mm]

PREMASGARD® 814x-Modbus



PREMASGARD® 814x-Modbus
with display



MFT-20-K
Mounting flange, plastic



Device version with **M12 connector** (optional on request)



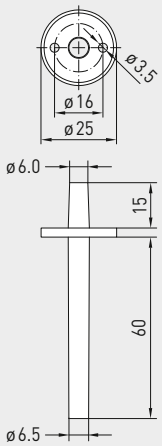
TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0...**247** adjustable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	–30...+70 °C
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material: polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optional 100 mm), v_{max} = 30 m/s (air) (on request, optional stainless steel **V2A** (1.4301), Ø 16 mm)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing only! (PLEUROFORM IP 30)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** programmable, cut-out approx. 70 x 40 mm (W x H), for display actual humidity, actual temperature and ACTUAL pressure (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table
ASD-06	**Connection set** (nipple straight) (included in the scope of delivery)
MFT-20K	**Mounting flange** plastic (included in the scope of delivery)

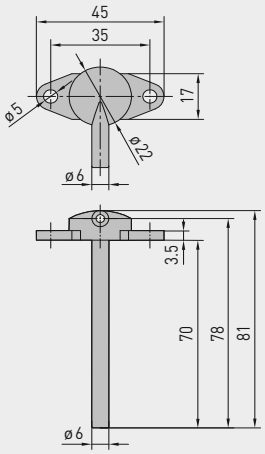
PREMASGARD® 814x - Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

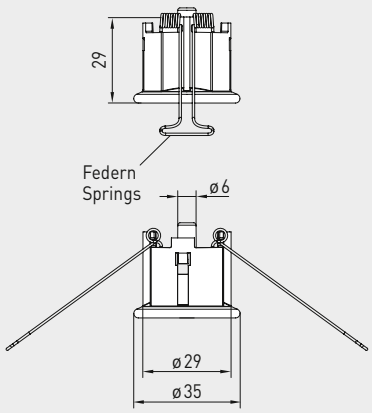
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



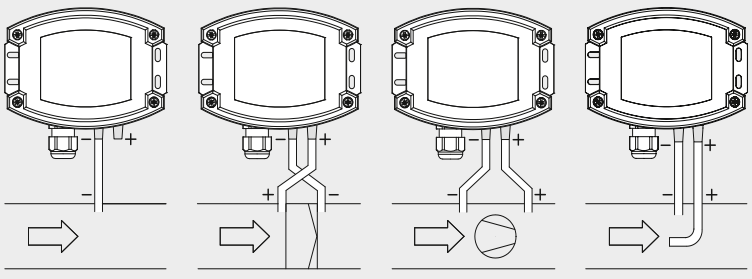
ASD-07
Connection nipple



DAL-01
Pressure outlet



Mounting diagram **PREMASGARD® 814x - Modbus**



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

Switchable system of units

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]
Humidity	[%RH]	→	[%RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixture ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]
Air density	[kg/m³]	→	[lb/ft³]

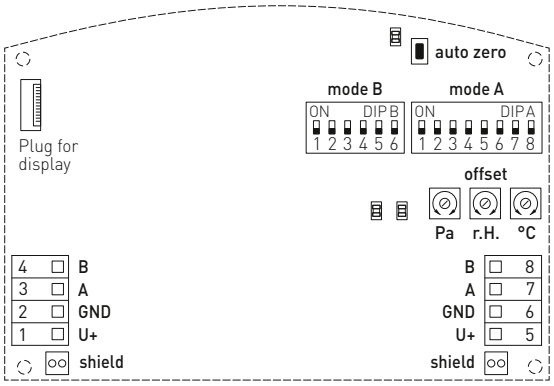
Measuring ranges	SI (default)	→	Imperial
Type 8148	–500…+500 Pa	→	–2.0…+2.0 inWC
Type 8147	–7000…+7000 Pa	→	–28…+28 inWC
Type 814x	–35…+80 °C	→	–31…+176 °F
Type 814x	0…100 %RH	→	0…100 %RH

Alternative parameters are calculated internally.

PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers for humidity, temperature, pressure, differential pressure and volume flow, incl. mounting flange and connection set, calibratable, with Modbus connection

Schematic diagram **PREMASGARD® 814x-Modbus**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Reset button
Offset correction
Shielding

PREMASGARD® 814x-Modbus with display





SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

stainless steel protective tube
(optional on request)

PREMASGARD® 814x-Modbus	Multifunctional duct sensor for humidity, temperature, pressure, differential pressure and volume flow rate, *Deluxe*					
Type / WG02	**Measuring ranges** Pressure	Humidity	Temperature	**Output** Display	**Item no.**	**Price**
Type 8148	**± 500 Pa**					
PREMASGARD 8148-Modbus	–500...+500 Pa	0...100 % RH	–35...+80°C	Modbus	1301-8144-0910-20V	**531,80 €**
PREMASGARD 8148-Modbus **LCD**	–500...+500 Pa	0...100 % RH	–35...+80°C	Modbus ■	1301-8144-4910-20V	**580,77 €**
	Equipped as standard with automatic zero point calibration					
Type 8147	**± 7000 Pa**					
PREMASGARD 8147-Modbus	–7000...+7000 Pa	0...100 % RH	–35...+80°C	Modbus	1301-8144-0950-200	**470,15 €**
PREMASGARD 8147-Modbus **LCD**	–7000...+7000 Pa	0...100 % RH	–35...+80°C	Modbus ■	1301-8144-4950-200	**519,73 €**
Extra charge:	**with optional automatic zero point calibration** (please specify in your order)					**74,74 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	
Note:	System of units **SI** (default) or **imperial** (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**82,20 €**
ASD-06	**Connection set** (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws				7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90° angle) made of ABS				7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)				7300-0060-3000-001	**36,84 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)				7000-0050-2200-100	**43,60 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)				7000-0031-0000-000	**9,85 €**
	For further information see last chapter!					

AERASGARD® RCO2 / RLQ - CO2 - Modbus
AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

Multifunctional indoor climate sensor **AER**ASGARD® **RFTM - LQ - PS - CO2 - Modbus** (maximum expansion level) with Modbus connection, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with / without display, type variant **RFTM - CO2 - Modbus** optionally with / without setpoint potentiometer. The room sensor is used for detecting the air humidity (0…100 % RH), room temperature (0…+50 °C), air quality (VOC) (0…100 %), the fine dust (PM) (0…1000 µg/m³) and CO2 content (0…5000 ppm) as well as a room control unit (% setpoint). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), fine dust (PM) and carbon dioxide (CO2). Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The air quality is determined based on a (VOC) **mixed gas sensor**. The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and two-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RFTM - CO2 - Modbus - P
with display and potentiometer



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
System of units:	**SI** (default) or **imperial** (can be changed via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], fine dust (PM) [µg/m³], air quality (VOC) [%], carbon dioxide (CO2) [ppm], setpoint potentiometer [%]
HUMIDITY & TEMPERATURE	
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range:	0…100 % RH (humidity) 0…+50 °C (temperature)
Deviation, humidity:	typically **± 2,0** % (20…80 % RH) at +25 °C, otherwise ± 3,0 %
Deviation, temperature:	typically ± 0,2 K at +25 °C
AIR QUALITY (VOC)	
Sensor (VOC):	**VOC sensor** (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range (VOC):	0…100 % air quality; with reference to calibration gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy (VOC):	typically ± 20 % final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)
FINE DUST (PM)	
Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology
Measuring range (PM):	0…1000 µg/m³
Particle size (PM):	**PM 2.5** (0.3…2.5 µm); **PM 10** (0.3…10 µm)
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life (PM):	> 10 years
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical **NDIR sensor** (non-dispersive infra-red technology) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range (CO2):	0…5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is greater)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	Diffusion

Continued on next page!

Display screen **standard** — **Modbus** (Baldur)



Carbon dioxide (CO2) [ppm]



Air quality (VOC) [%]



Temperature [°C] [°F]



Humidity [% RH]



Fine dust (PM) [µg/m³]

Display screen **programmable** — **Modbus** (Baldur)



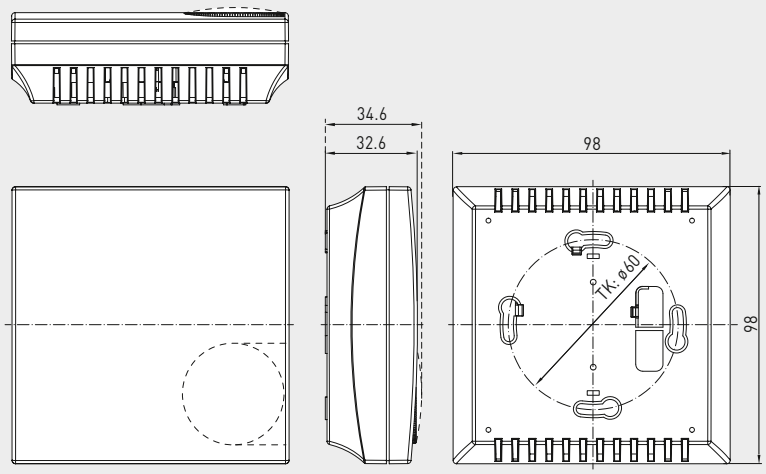
Symbols

AERASGARD® RCO2 / RLQ - CO2 - Modbus
AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

Dimensional drawing [mm]

Housing **Baldur 2**



R xx CO2 - Modbus
without display



RFTM - LQ - PS - CO2 - Modbus
with display





TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Ambient temperature:	0...+ 50 °C
Permissible air humidity:	0...95 % RH (non-precipitating air)
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**Display with illumination,** 2-line, cutout approx. 36 x 15 mm (W x H), to display actual humidity, actual temperature, air quality, of the fine-dust and CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value

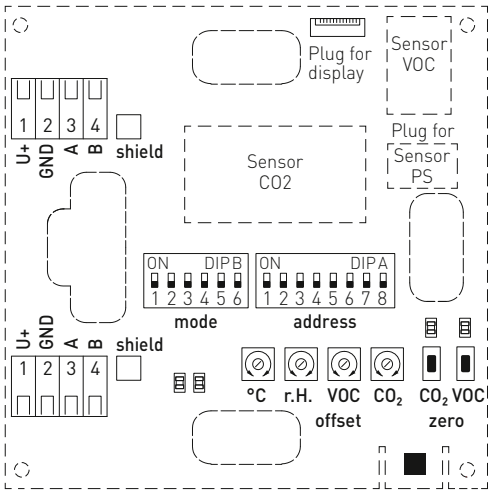
AERASGARD® RCO2 / RLQ - CO2 - Modbus
AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

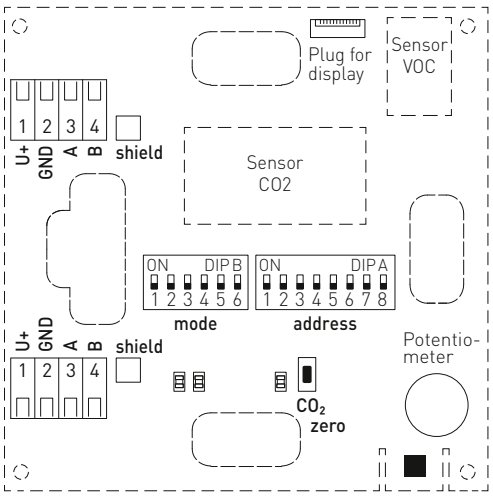
Modbus

S+S REGELTECHNIK

Schematic diagram **Rxx - Modbus**



Schematic diagram with potentiometer **RFTM - CO2 - Modbus - P**



Display screen **standard (cyclic)**



Carbon dioxide (CO2)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen **alternative (static)**



Carbon dioxide (CO2)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen **programmable** **Modbus** (Baldur)



Symbols

The Modbus interface allows the display to be **individually** configured both in the 7-segment range and in the dot-matrix range.
For improved legibility, backlighting is provided.

SI IMP

By default, the display indicates the measurements with the corresponding units **cyclically** and consecutively:

CO2 content, **air quality** (VOC), **temperature**, **relative humidity**, **fine dust** (PM).

The **Modbus** configuration can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value and index while the second line indicates the corresponding unit **statically**. The index identifies the display type:

Index 1 = carbon dioxide (CO2) [ppm]
Index 2 = air quality (VOC) [%]
Index 3 = temperature [°C] [°F]
Index 4 = relative humidity [% RH]
Index 6 = fine dust (PM) [µg/m³]

AERASGARD® RCO2 / RLQ-CO2-Modbus
AERASGARD® RFTM-LQ-PS-CO2-Modbus

Multifunctional room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, calibratable, with Modbus connection

RFTM-CO2-Modbus-P
with setpoint potentiometer (room control unit)



RFTM-LQ-PS-CO2-Modbus
with display



R xx CO2-Modbus
without display



AERASGARD® Rxx-Modbus	Room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, *Deluxe*							
Type / WG02	**Measuring Range** Humidity	Temperature*	PM	CO2	VOC	**Display** ☼=P	**Item No.**	**Price**
RCO2-Modbus								
RCO2-Modbus	–	–	–	5000 ppm	–		1501-61B0-6001-200	**280,79 €**
RCO2-Modbus **LCD**	–	–	–	5000 ppm	–	■	1501-61B0-6021-200	**332,13 €**
RLQ-CO2-Modbus								
RLQ-CO2-Modbus	–	–	–	5000 ppm	0...100 %		1501-61B1-6001-500	**411,59 €**
RLQ-CO2-Modbus **LCD**	–	–	–	5000 ppm	0...100 %	■	1501-61B1-6021-500	**462,91 €**
RFTM-PS-Modbus								
RFTM-PS-Modbus	0...100 % RH	0...+50 °C	0...1000 µg/m³	–	–		1501-2116-6001-200	**382,69 €**
RFTM-PS-Modbus **LCD**	0...100 % RH	0...+50 °C	0...1000 µg/m³	–	–	■	1501-2116-6021-200	**439,73 €**
RFTM-CO2-Modbus								
RFTM-CO2-Modbus	0...100 % RH	0...+50 °C	–	5000 ppm	–		1501-61B6-6001-200	**331,32 €**
RFTM-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	–	■	1501-61B6-6021-200	**382,40 €**
RFTM-CO2-Modbus-P								
RFTM-CO2-Modbus-**P**	0...100 % RH	0...+50 °C	–	5000 ppm	–	☼	1501-61B6-6501-271	**366,65 €**
RFTM-CO2-Modbus-**P LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	–	☼ ■	1501-61B6-6521-271	**417,97 €**
RFTM-LQ-CO2-Modbus								
RFTM-LQ-CO2-Modbus	0...100 % RH	0...+50 °C	–	5000 ppm	0...100 %		1501-61B8-6001-500	**448,97 €**
RFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	–	5000 ppm	0...100 %	■	1501-61B8-6021-500	**500,29 €**
RFTM-LQ-PS-CO2-Modbus								
RFTM-LQ-PS-CO2-Modbus	0...100 % RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %		1501-2119-6001-500	**580,02 €**
RFTM-LQ-PS-CO2-Modbus **LCD**	0...100 % RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %	■	1501-2119-6021-500	**631,34 €**
Housing variant "P":	**Room control unit** with potentiometer (standard printing is a widening arrow with central position unfilled)							
Note:	These units must **not** be used as safety-relevant devices!							
	* International system of units **SI** (default) can be changed to **imperial** (via Modbus).							

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**

AERASGARD® FSFTM - CO2 - Modbus

Room humidity, temperature and CO2 sensor or measuring transducer, in-wall in the panel switch programme, with Modbus connection

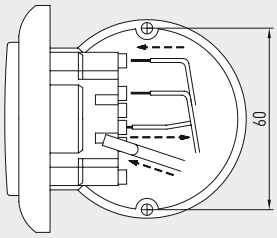
The room sensor and measuring transducer **AER**ASGARD® **FSFTM - CO2 - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the CO2 content, relative humidity and temperature of the air, and for setpoint adjustment.
The measured values are queried via the Modbus interface.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity (% RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

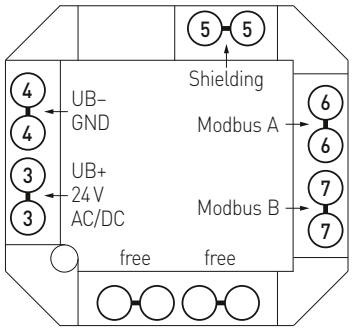
Mounting diagram **in-wall**



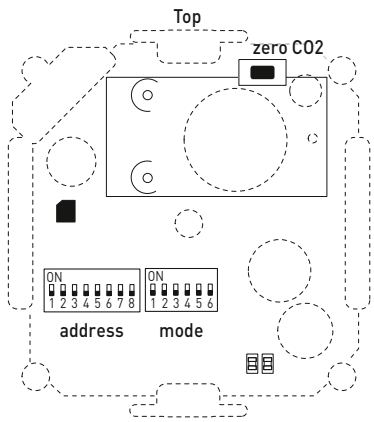
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.4 W / 24 V DC; < 6.4 VA / 24 V AC
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air [ppm] as well as setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	4 s / 32 s
CARBON DIOXIDE (CO2)	
Sensor, CO2:	**optical NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...5000 ppm
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
HUMIDITY	
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %
TEMPERATURE	
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFTM - CO2 - Modbus**



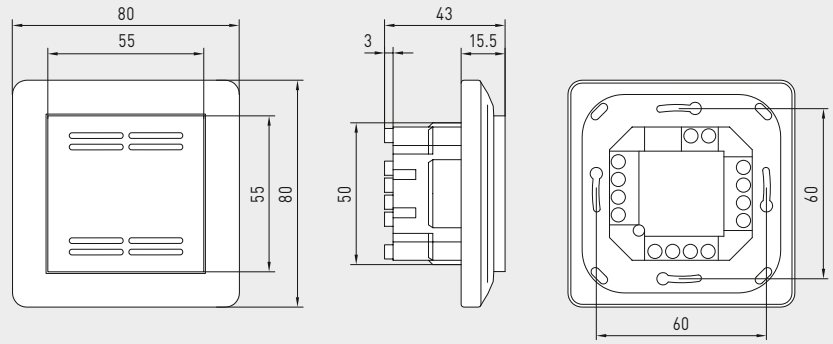
Schematic diagram **FSFTM - CO2 - Modbus**



S+S REGELTECHNIK

Room humidity, temperature and CO2 sensor or measuring transducer, in-wall in the panel switch programme, with Modbus connection

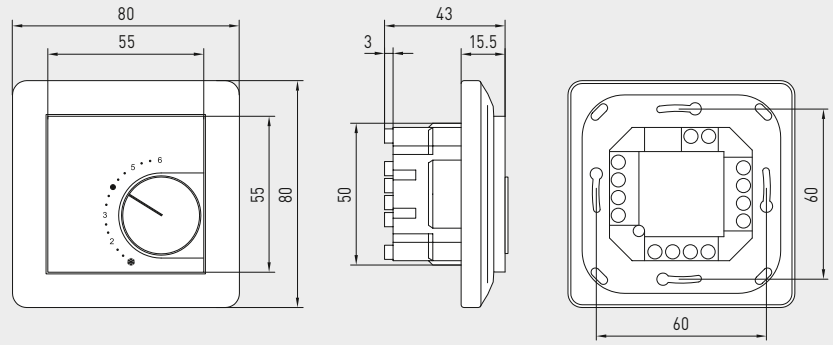
Dimensional drawing **FSFTM-CO2-Modbus**



FSFTM-CO2-Modbus
Standard



Dimensional drawing **FSFTM-CO2-Modbus-P**



FSFTM-CO2-Modbus-P
with potentiometer



AERASGARD® FSTFM-CO2-Modbus Room temperature humidity and CO2 sensor, in-wall

Type / WG02	Measuring Range CO2	Humidity	Temperature	Control element	Output	Item No.	Price
FSTFM-CO2-Modbus							
FSFTM-CO2-Modbus	0...5000 ppm	0...100 % RH	0...+50 °C	–	Modbus	1501-9226-6001-162	**385,89 €**
FSFTM-CO2-Modbus P	0...5000 ppm	0...100 % RH	0...+50 °C	Potentiometer	Modbus	1501-9226-6501-282	**476,26 €**
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air [ppm] and setpoint potentiometer						
ACCESSORIES							
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)					1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks					1906-1300-0000-100	**82,20 €**

AERASGARD® ACO2 / ALQ-CO2-Modbus
AERASGARD® AFTM-(LQ)-CO2-Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

The maintenance-free on-wall sensor **AER**ASGARD® **AFTM-LQ-CO2-Modbus** (max. expansion level) and **ACO2 / ALQ-CO2 / AFTM-CO2-Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100 % VOC), the temperature (–35...+80 °C) and the relative air humidity (0...100 % RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Deviation in temperature:	typically ± 0.4 K at +25 °C
AIR QUALITY (VOC)	
Sensor (VOC):	VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range (VOC):	0...100 % air quality; referred to calibrating gas; **multi-range switching** VOC sensitivities (low/medium/high)
Measuring accuracy (VOC):	typically ± 20 % of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions)
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0,5 % of measured value per °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	by diffusion

Continued on next page!

Display screen (cyclic) **Modbus Tyr 2**



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen (static)



Atmospheric pressure (Example Index 5)

Programmable display screen

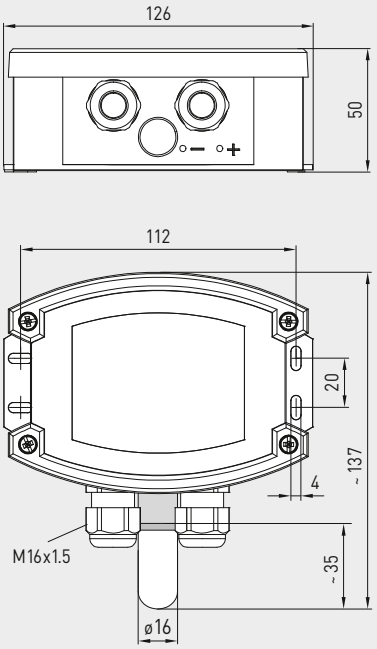


AERASGARD® ACO2 / ALQ - CO2 - Modbus
AERASGARD® AFTM - (LQ) - CO2 - Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Dimensional drawing

AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with plastic sinter filter (standard)



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with display and plastic sinter filter (standard)





SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

SI IMP

TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes
Ambient temperature:	–10...+60 °C
Electrical connection:	0.2 - 1.5 mm², ia push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),,housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

AERASGARD® ACO2 / ALQ - CO2 - Modbus
AERASGARD® AFTM - (LQ) - CO2 - Modbus

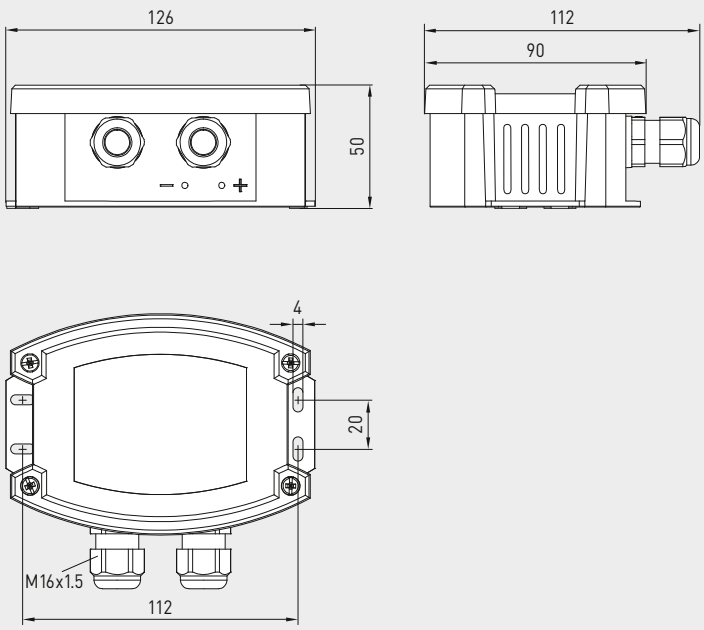
Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Modbus

S+S REGELTECHNIK

Dimensional drawing

ACO2-Modbus
ALQ - CO2-Modbus



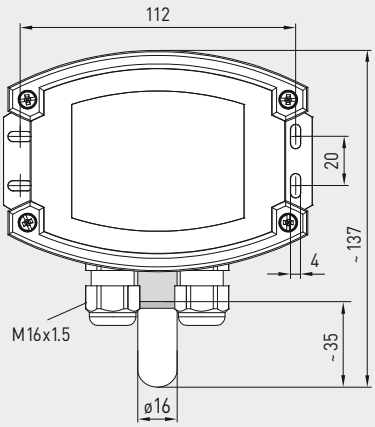
ACO2-Modbus
ALQ - CO2-Modbus





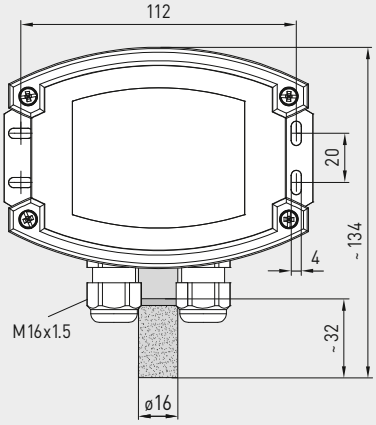
Dimensional drawing

AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus



SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with metal sinter filter
(optional)

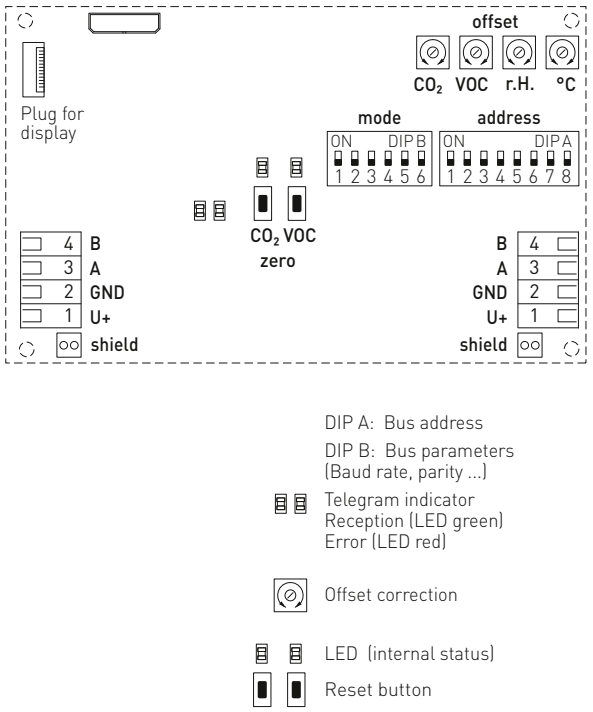




AERASGARD® ACO2 / ALQ-CO2-Modbus
AERASGARD® AFTM-(LQ)-CO2-Modbus

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Schematic diagram **AFTM-LQ-CO2-Modbus**



AFTM-LQ-CO2-Modbus
with display





AERASGARD® ACO2-Modbus	On-wall sensor for CO2 content, *Deluxe*
AERASGARD® ALQ-CO2-Modbus	On-wall sensor for CO2 content and air quality (VOC), *Deluxe*
AERASGARD® AFTM-CO2-Modbus	Multifunctional on-wall sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® AFTM-LQ-CO2-Modbus	Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature*	CO2	VOC	Display	Item No.	Price
ACO2-Modbus							
ACO2-Modbus	–	–	5000 ppm	–		1501-7110-6001-200	**386,67 €**
ACO2-Modbus **LCD**	–	–	5000 ppm	–	■	1501-7110-6071-200	**460,63 €**
ALQ-CO2-Modbus							
ALQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-7111-6001-500	**521,20 €**
ALQ-CO2-Modbus **LCD**	–	–	5000 ppm	0...100 %	■	1501-7111-6071-500	**609,62 €**
AFTM-CO2-Modbus							
AFTM-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	–		1501-7116-6001-200	**485,07 €**
AFTM-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	–	■	1501-7116-6071-200	**580,98 €**
AFTM-LQ-CO2-Modbus							
AFTM-LQ-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %		1501-7118-6001-500	**619,86 €**
AFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-7118-6071-500	**732,95 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
Note:	This unit **must not** be used as safety-relevant device!						
*	International system of units **SI** (default) can be changed to **imperial** (via Modbus).						

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information see last chapter!		

AERASGARD® KCO2 / KLQ-CO2-Modbus
AERASGARD® KFTM-(LQ)-CO2-Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

The maintenance-free duct sensor **AER**ASGARD® **KFTM-LQ-CO2-Modbus** (max. expansion level) and **KCO2 / KLQ-CO2 / KFTM-CO2-Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), incl. mounting flange, optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100 % VOC), the temperature (–35...+80 °C) and the relative air humidity (0...100 % RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

Innovative Modbus sensor with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	**SI** (default) or **Imperial** (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Deviation in temperature:	typically ± 0.2 K at +25 °C
AIR QUALITY (VOC)	
Sensor:	VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)
Measuring range:	0...100 % air quality; referred to calibrating gas; **multi-range switching** VOC sensitivities (low/medium/high)
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life	> 60 months (under normal load conditions)
CARBON DIOXIDE (CO2)	
Sensor:	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) **with manual calibration** (via zero button), **with automatic calibration** (can be deactivated via Modbus)
Measuring range:	0...5000 ppm
Measuring accuracy:	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence:	± 5 ppm per °C or ± 0,5 % of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion

Continued on next page!

Display screen (cyclic) **Modbus Tyr 2**



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen (static)



Atmospheric pressure (Example Index 5)

Programmable display screen

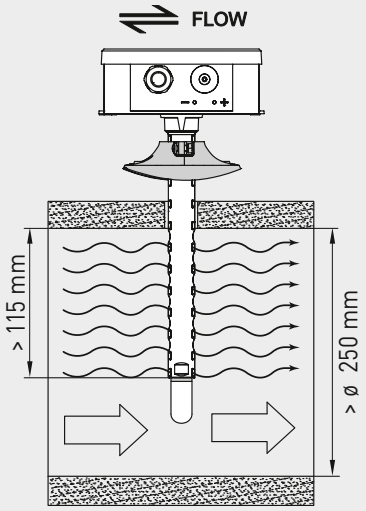


AERASGARD® KCO2 / KLQ - CO2 - Modbus
AERASGARD® KFTM - (LQ) - CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Mounting diagram [mm]

KCO2 - Modbus
KLQ - CO2 - Modbus
KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



PATENTED

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus
with plastic sinter filter (standard)





MFT-20-K
Mounting flange, plastic

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus
with display and plastic sinter filter (standard)





SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

TECHNICAL DATA (continued)

Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes, minimal flow velocity 0.3 m/s (air)
Ambient temperature:	–10...+60 °C
Electrical connection:	0.2 - 1.5 mm², ia push-in terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),,housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, v_{max} = 30 m/s (air) Ø 20 mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)
Process connection:	via mounting flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

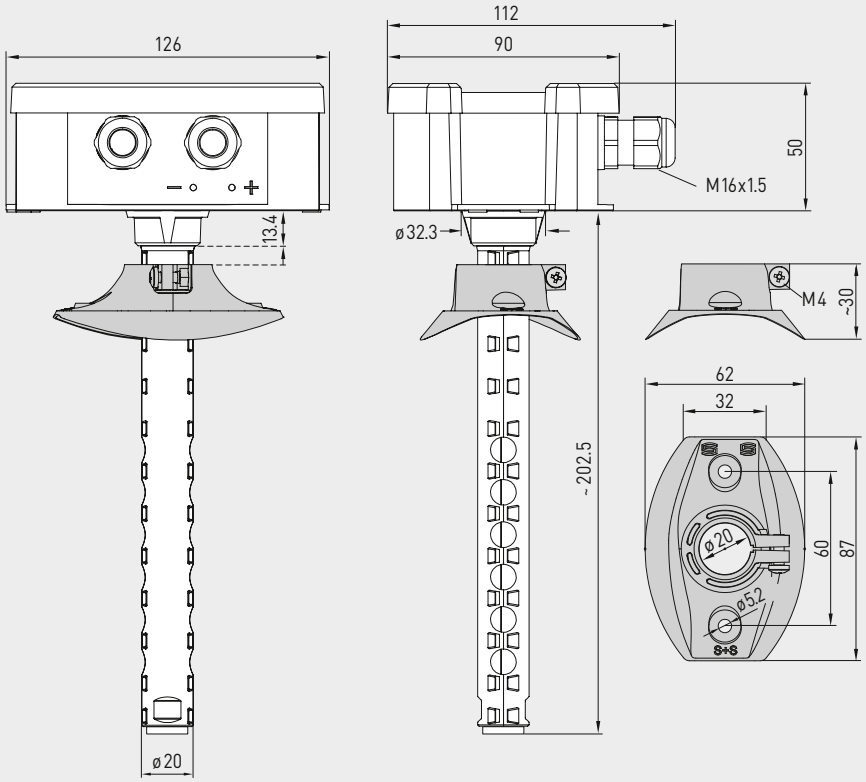
AERASGARD® KCO2 / KLQ - CO2 - Modbus
AERASGARD® KFTM - (LQ) - CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

S+S REGELTECHNIK

Dimensional drawing
[mm]

KCO2-Modbus
KLQ - CO2-Modbus

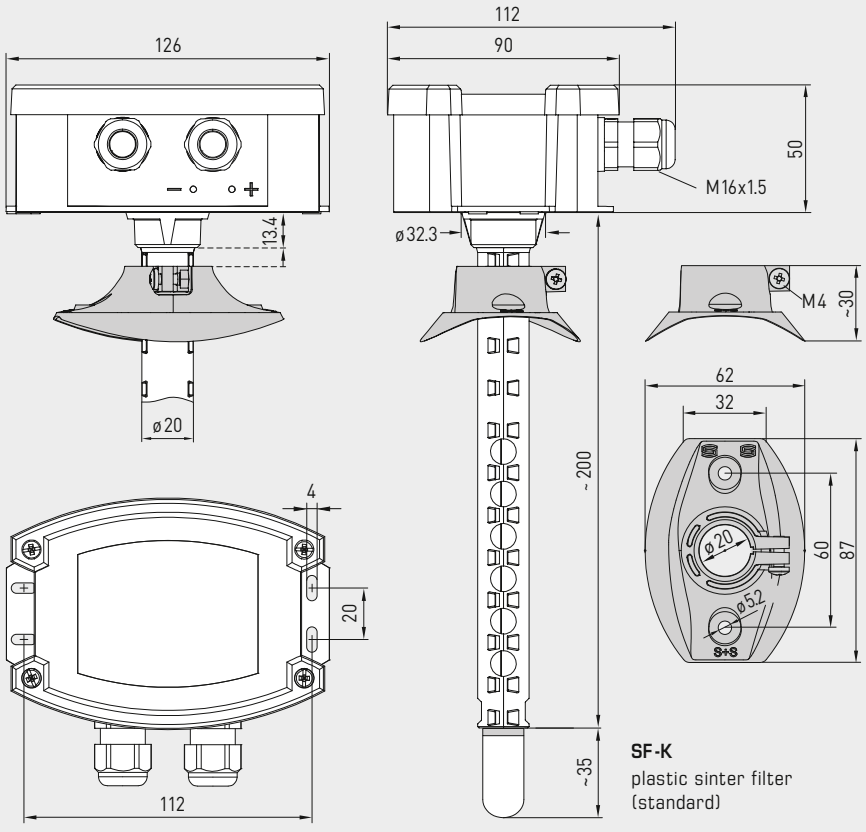


KCO2-Modbus
KLQ - CO2-Modbus



Dimensional drawing
[mm]

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



SF-K
plastic sinter filter
(standard)

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus

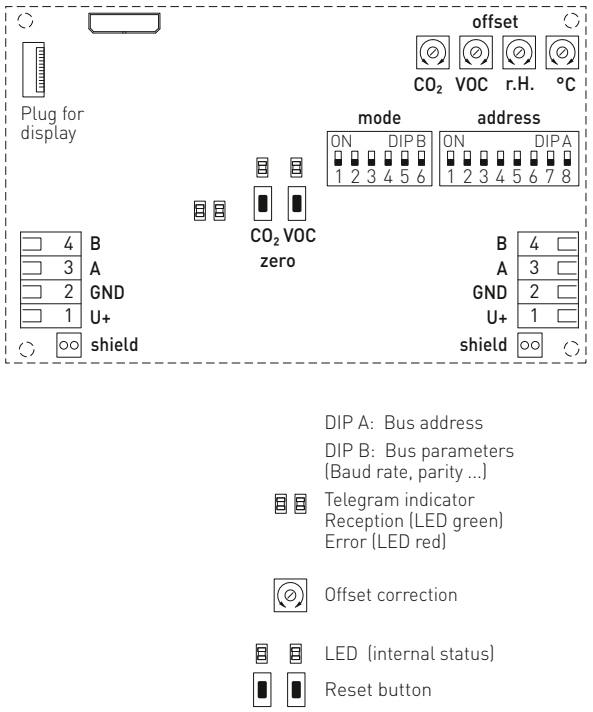


SF-M
metal sinter filter
(optional)

AERASGARD® KCO2 / KLQ-CO2-Modbus
AERASGARD® KFTM-(LQ)-CO2-Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Schematic diagram **KFTM-LQ-CO2-Modbus**



KFTM-LQ-CO2-Modbus
with display



AERASGARD® KCO2-Modbus	Duct sensor for CO2 content, *Deluxe*
AERASGARD® KLQ-CO2-Modbus	Duct sensor for air quality (VOC) and CO2 content, *Deluxe*
AERASGARD® KFTM-CO2-Modbus	Multifunctional duct sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® KFTM-LQ-CO2-Modbus	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature*	CO2	VOC	Display	Item No.	Price
KCO2-Modbus							
KCO2-Modbus	–	–	5000 ppm	–		1501-8110-6001-200	**386,67 €**
KCO2-Modbus **LCD**	–	–	5000 ppm	–	■	1501-8110-6071-200	**448,70 €**
KLQ-CO2-Modbus							
KLQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-8111-6001-500	**436,50 €**
KLQ-CO2-Modbus **LCD**	–	–	5000 ppm	0...100 %	■	1501-8111-6071-500	**509,98 €**
KFTM-CO2-Modbus							
KFTM-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	–		1501-8116-6001-200	**396,64 €**
KFTM-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200	**483,83 €**
KFTM-LQ-CO2-Modbus							
KFTM-LQ-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %		1501-8118-6001-500	**518,71 €**
KFTM-LQ-CO2-Modbus **LCD**	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-8118-6071-500	**609,62 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	
Note:	This unit **must not** be used as safety-relevant device!						
*	International system of units **SI** (default) can be changed to **imperial** (via Modbus).						

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**82,20 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
MFT-20-K	**Mounting flange,** plastic (included in the scope of delivery)	7000-0031-0000-000	**9,85 €**
	For further information, see last chapter Accessories!		

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

Calibratable duct air flow sensor **RHE**ASGARD® **KLGF-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector as per DIN EN 61076-2-101) optionally with / without display, to determine the flow velocity (0.1...20 m/s).

Calibratable duct air flow sensor **RHE**ASGARD® **KLGFVT-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector as per DIN EN 61076-2-101) optionally with/ without display, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C). The following parameters can be retrieved from the Modbus: flow velocity, volume flow (calculated) and temperature.

The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated). The sensor is factory-calibrated.

TECHNICAL DATA	
Power supply:	24 V AC / DC (± 10 %)
Current consumption:	approx. 4 VA
Data points:	Flow velocity [m/s], volume flow [m³/h], temperature [°C]
AIR FLOW	
Sensor:	Calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)
Measuring range:	0.1...20 m/s
Accuracy:	0.5 m/s + 3 % measured value
Long-term stability:	± 0.5 % final value per year
Reproducibility:	± 1.0 % final value
Warm-up time:	< 2 min
Response time:	< 5 s
Start-up override:	0...120 s (adjustable via potentiometer)
TEMPERATURE	**KLGF(V)T**
Sensor:	NTC 10k
Measuring range:	0...+50 °C
Accuracy:	typical ± 0.5 K at +25 °C
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	0...30 values
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20mm, NL = 220 mm, v_{max} = 30 m/s (air), **stainless steel V2A** (1.4301), Ø 16 mm available upon request as an option
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**Cable gland** made of plastic (M 16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm), optionally with **M12 connector** as per DIN EN 61076-2-101
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Process connection:	by means of plastic mounting flange (included in the scope of delivery)
Ambient temperature:	Storage –20...+50 °C; operation 0...+50 °C
Medium temperature:	0...+70 °C
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances
Protection class:	III (as per EN 60 730)
Protection type:	**IP 65** (as per EN 60 529) housing; IP 20 sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**Display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature (cyclical) or a selectable parameter (static)
ACCESSORIES	see last chapter

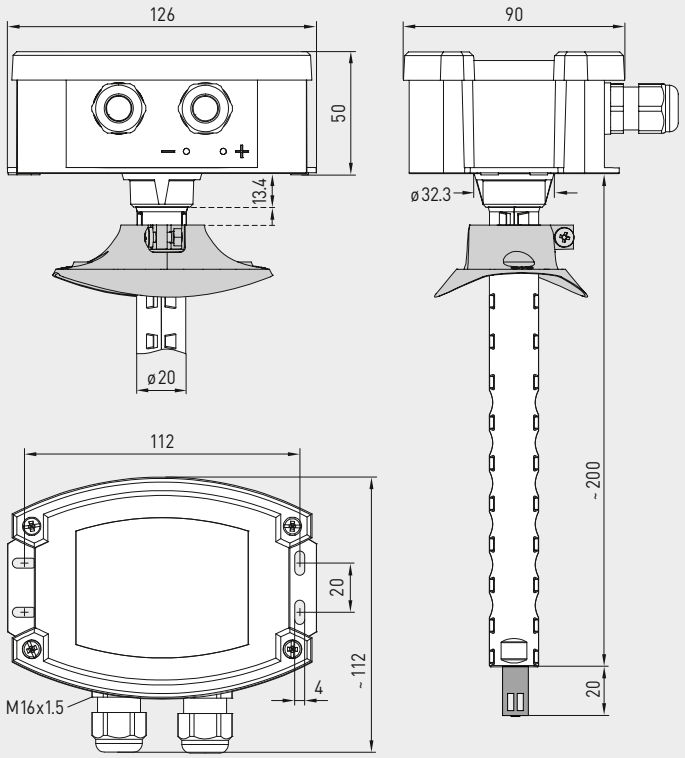
NEW

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

Dimensional drawing [mm]

KLGF-Modbus
KLGFVT-Modbus



KLGF-Modbus
KLGFVT-Modbus

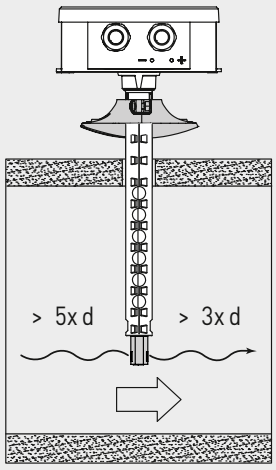


KLGF-Modbus
with display



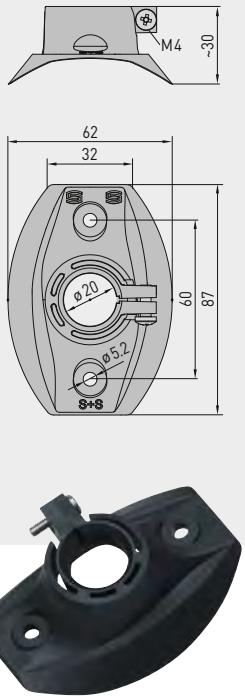
Installation diagram

KLGF-Modbus
KLGFVT-Modbus



Dimensional drawing [mm]

MFT-20-K



KLGFVT-Modbus
with display



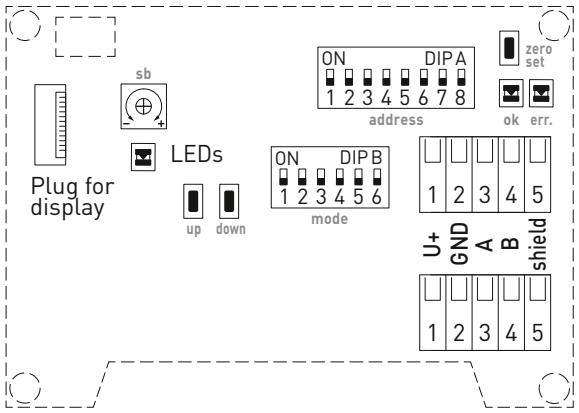
MFT-20-K
Mounting flange
made of plastic

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

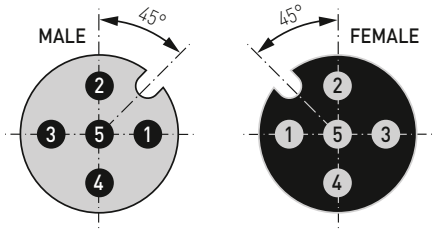
Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

S+S REGELTECHNIK

Schematic diagram **KLGF-Modbus**

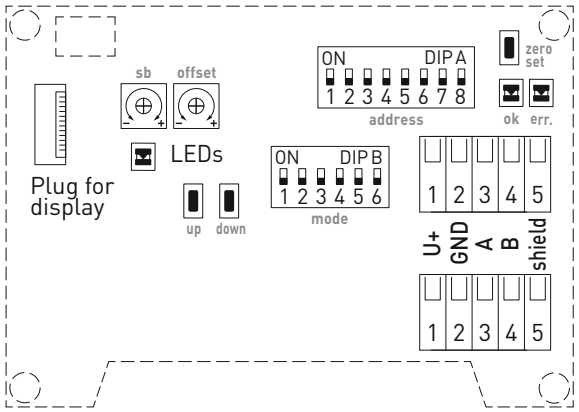


Pin assignment (M12) **xx-Modbus**

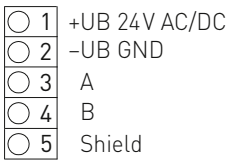


1 +UB
2 Modbus A
3 –UB GND
4 Modbus B
5 Shield

Schematic diagram **KLGFVT-Modbus**



Connecting diagram **KLGF-Modbus** **KLGFVT-Modbus**



NEW

RHEASGARD® KLGF-Modbus
RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, incl. mounting flange, calibratable, Modbus connector

KLGFVT-Modbus
with display



KLGF-Modbus
with display



RHEASGARD®
KLGF-Modbus Duct air flow sensor or measuring transducer, *Deluxe*
KLGFVT-Modbus Duct air flow sensor or measuring transducer for flow velocity, volume flow and temperature, *Deluxe*

Type / WG01	Measuring ranges Flow velocity	Volume flow	Temperature	Output	Display	Item no.	Price
KLGF-Modbus							
KLGF-Modbus	0,1...20 m/s	–	–	Modbus		1701-4216-0101-000	**300,76 €**
KLGF-Modbus **LCD**	0,1...20 m/s	–	–	Modbus	■	1701-4216-1101-000	**364,62 €**
KLGFVT-Modbus							
KLGFVT-Modbus	0,1...20 m/s	0...200.000 m³/h	0...+50 °C	Modbus		1701-4216-0401-000	**327,82 €**
KLGFVT-Modbus **LCD**	0,1...20 m/s	0...200.000 m³/h	0...+50 °C	Modbus	■	1701-4216-1401-000	**389,34 €**
Optional:	Cable connection with **M12 connector** as per DIN EN 61076-2-101					on request	
ACCESSORIES							
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection					1906-1200-0000-100	**220,41 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**82,20 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)					7000-0031-0000-000	**9,85 €**
	For further information see last chapter!						

RHEASGARD® KHSSFV-Modbus

Duct top-hat rail air flow sensor or measuring transducer for flow velocity and volume flow, electronic, external flow probe incl. mounting flange, calibratable, with Modbus connection

S+S REGELTECHNIK

Electronic duct top-hat rail air flow sensor **RHE**ASGARD® **KHSSFV-Modbus** with Modbus connection, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1...20 m/s). The following parameters can be retrieved from the Modbus: Flow velocity and volume flow (calculated).

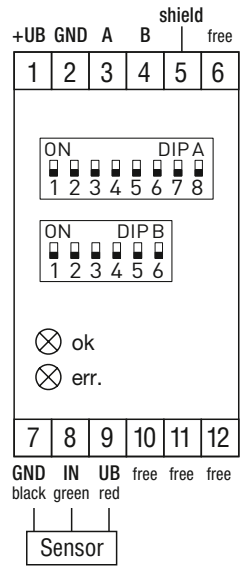
The flow sensors is suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display. The sensor is factory-calibrated.

TECHNICAL DATA

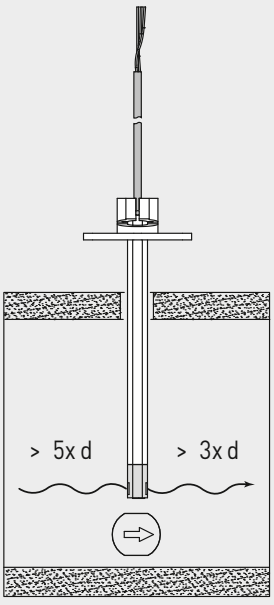
Power supply:	24 V AC / DC (± 10 %)
Current consumption:	approx. 4 VA
Data points:	Flow velocity [m/s], volume flow [m³/h]
AIR FLOW	
Sensor:	calorimetric, temperature compensated, sensor breakage protection
Measuring range:	0.1...20 m/s
Accuracy:	0.5 m/s + 3 % measured value
Long-term stability:	± 0.5 % of final value per year
Reproducibility:	± 1.0 % of final value
Warm up time:	< 2 min
Response time:	< 5 s
Start-up override:	20 m/s for 60 s (after applying the supply voltage)
GENERAL	
Bus protocol:	Modbus (RTU mode), Address range can be set from 0...**247**
Signal filtering:	0...30 values
LED operating status indicator:	**Green LED** [ok] error-free protocol received **Red LED** [err.] protocol or checksum contains errors
Housing:	PC / ABS (UL94-V0) material, light grey colour, 36 mm (2TE) wide for 35 mm mounting rail, approx. 90 x 36 x 58 mm (HxWxD)
Probe/sensor:	Polyamide (PA6) material, white colour (blue sensor holder), with torsion protection, Ø 12 mm, EL = approx. 20–155 mm, v_{max} = 20 m/s (air)
Sensor cable:	PVC LiYY, 3-wire, KL = approx. 2.4 m
Electrical connection:	0.14–2.5 mm², via screw terminal
Process connection:	by means of mounting flange with seal (included in the scope of delivery)
Ambient temperature:	Storage –20...+50 °C; operation 0...+50 °C
Medium temperature:	0...+70 °C
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529) housing **IP 20** (according to EN 60 529) probe
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
ACCESSORIES	see last chapter

Connection diagram **KHSSFV-Modbus**

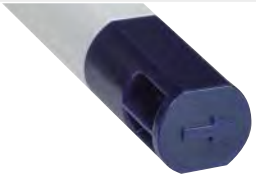


Note:
To set the internal DIP switches, the housing cover must be removed.

Mounting diagram **KHSSFV-Modbus**



Note for mounting:
Sensor works unidirectionally. Observe the markings for the direction of flow!



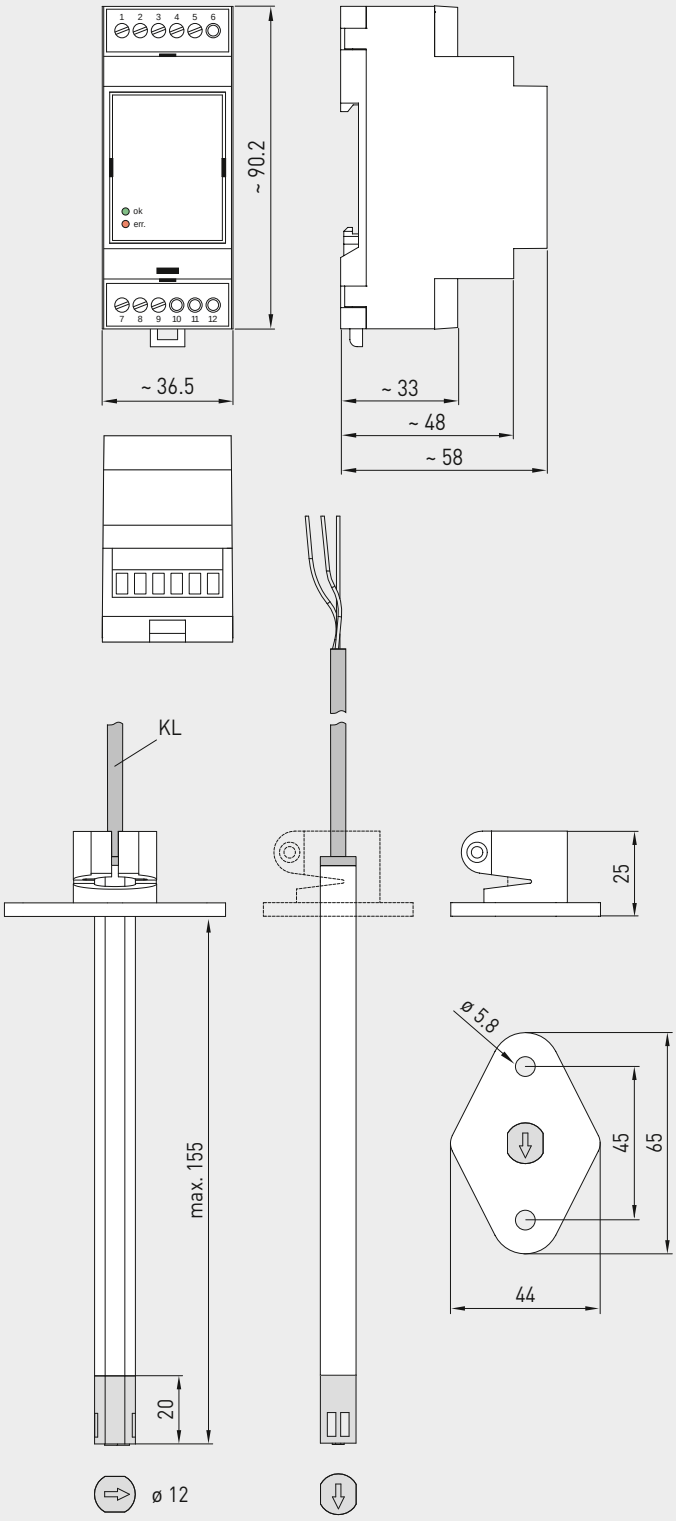
NEW

RHEASGARD® KHSSFV-Modbus

Duct top-hat rail air flow sensor or measuring transducer for flow velocity and volume flow, electronic, external flow probe incl. mounting flange, calibratable, with Modbus connection

Dimensional drawing [mm]

KHSSFV-Modbus



KHSSFV-Modbus
Housing



KHSSFV-Modbus
Probe



RHEASGARD® **KHSSFV-Modbus**	Duct top-hat rail air flow sensor or measuring transducer for flow velocity and volume flow, Deluxe				
Type / WG01	**Measuring ranges** Flow velocity	Volume flow	**Output**	**Item no.**	**Price**
KHSSFV-Modbus					
KHSSFV-Modbus	0.1...20 m/s	0...200.000 m³/h	Modbus	1701-5216-0302-000	**359,47 €**

Line termination device with terminating resistor for the active bus termination of RS485 networks

Line termination device **MOD**KON® **LA-Modbus T3** with terminating resistor, in an impact-resistant plastic housing with quick-locking screws.

The line termination serves as an active bus termination for RS485 networks (ANSI TIA/EIA-485), such as Modbus RTU. It contains a terminating resistor with a biasing network, which pre-defines the bus signals to a safe value (fail-safe biasing) during bus idle time.

The bus termination can be fully switched on or off via DIP switches. This allows various operating scenarios to be tested in a simple manner whenever servicing is needed.

For very long network cables, both end points can also be provided with an active bus termination to improve interference immunity under harsh environmental conditions.

LA-Modbus



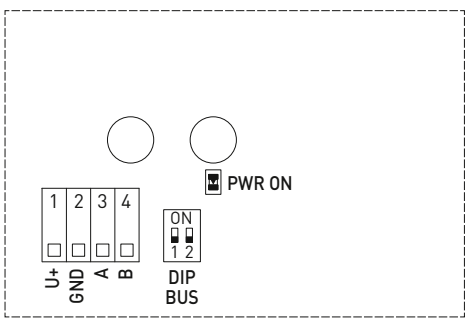
TECHNICAL DATA

Power supply:	24 V AC (±20 %) and 15...36 V DC
Power consumption:	< 0.5 W / 24 V DC; < 0.5 VA / 24 V AC
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	Cable gland, plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Operation display:	Status LED **PWR ON** (supply voltage)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU

DIP 1	DIP 2	Resistance (type adjustable)	Bus termination (explanation)
ON	**ON**	**R_{AB} active** and **R_{BIAS} active**	Line termination and BIAS active
ON	OFF	**R_{AB} active**	Line termination active
OFF	OFF	**Deactivated**	Bus termination switched off

Connecting diagram

LA-Modbus



Push-in terminal

+UB Terminal 1: +UB 24V

GND Terminal 2: –UB GND

A / B Terminal 3/4: RS485 Modbus

Status LED

PWR ON Supply voltage

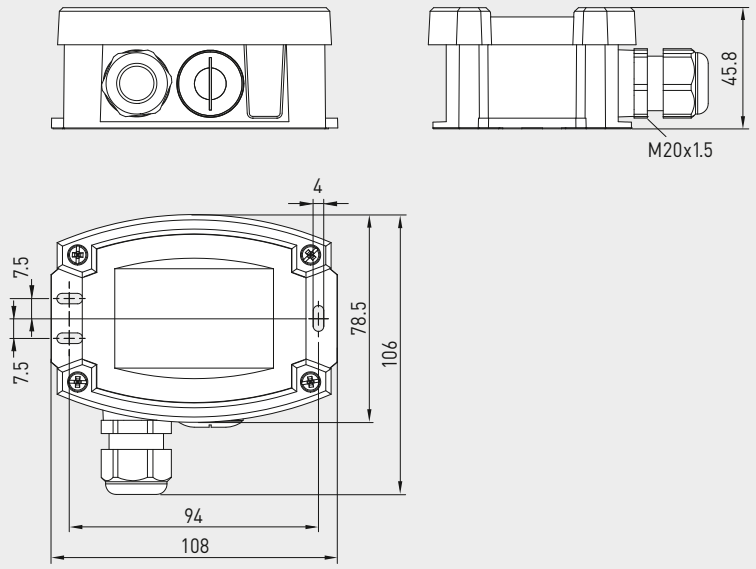
DIP switch

DIP BUS Activation or deactivation of the bus termination

S+S REGELTECHNIK

Line termination device with terminating resistor for the active bus termination of RS485 networks

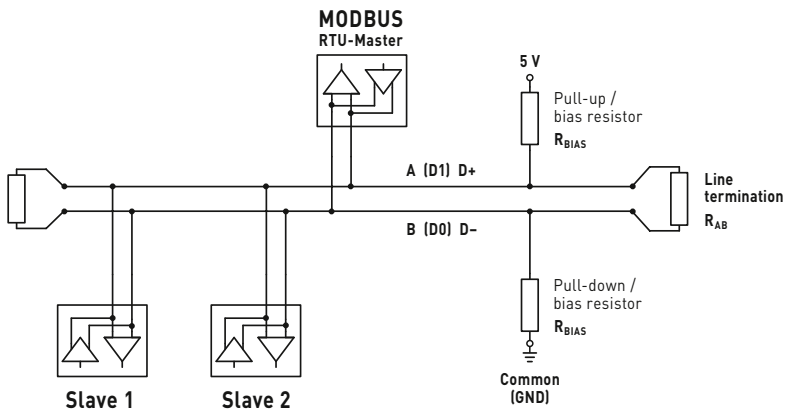
Dimensional drawing **LA-Modbus**



LA-Modbus



Bus topology with terminating and bias resistors **LA-Modbus**



MODKON® LA-Modbus Line termination device with terminating resistor

Type / WG01	Bus termination (adjustable)	Item No.	Price
LA-Modbus			
LA-Modbus	1. Line termination and BIAS active 2. Line termination active 3. Bus termination deactivated	1906-1300-0000-100	**82,20 €**

Note: The bus termination can be fully switched on or off (via DIP switches).

MODKON® KA2-Modbus

**Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors**

S+S REGELTECHNIK

Communication adapter **MOD**KON® **KA2-Modbus T3** with USB and RS485 interface, in an impact-resistant plastic housing with quick-locking screws, incl. software.

The communication adapter serves as connecting element between an S+S Modbus sensor and a PC (Windows). A standard USB port enables quick and straightforward connection to the system; there is no need for an additional power supply.

When used in combination with the S+S software **MODKON RTU** (included in delivery), it offers a very convenient way to test the response behaviour of the sensor.
The Auto Scan function of the software automatically detects the device type, the device address and the set bus parameters. In this way, communication with the connected S+S Modbus sensor is possible without the need for additional settings. The ideal first step to gain experience with Modbus technology.

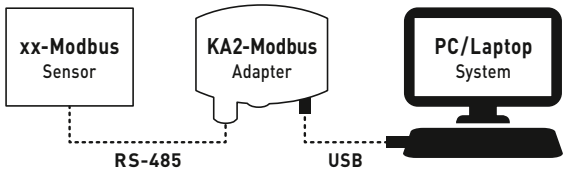
KA2-Modbus



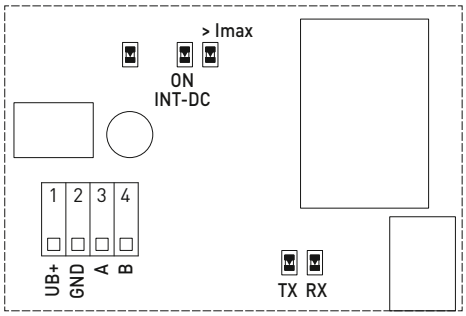
TECHNICAL DATA

Power supply:	Takes place via USB connection
Output:	Voltage: 15 V; Current: 100 mA
Interfaces:	Standard **USB** port for system connection, power supply **RS485** interface for connection of an S+S Modbus sensor
Compatibility:	S+S Modbus sensors for the device classes **THERM**ASGARD®, **HYGR**ASGARD®, **PREM**ASGARD®, **AER**ASGARD®
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 45.8 mm (Tyr 3)
Cable connection:	Cable gland, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) housing only!
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU

Mounting diagram **KA2-Modbus**



Connecting diagram **KA2-Modbus**



Push-in terminal

+UB	Output supply for S+S Modbus sensor
GND	approx. 15V (max. 100mA) with supply via USB
A / B	RS485 Modbus

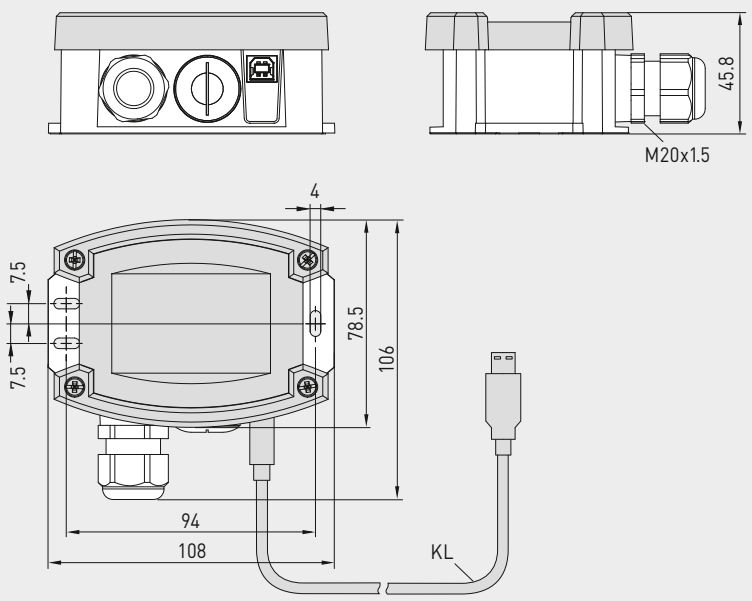
Status LEDs

>Imax	Electronic fuse approx. 150mA
INT-DC	Internal supply (USB)
TX	Transmit telegrams
RX	Receive telegrams

S+S REGELTECHNIK

**Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors**

Dimensional drawing **KA2-Modbus**



KA2-Modbus



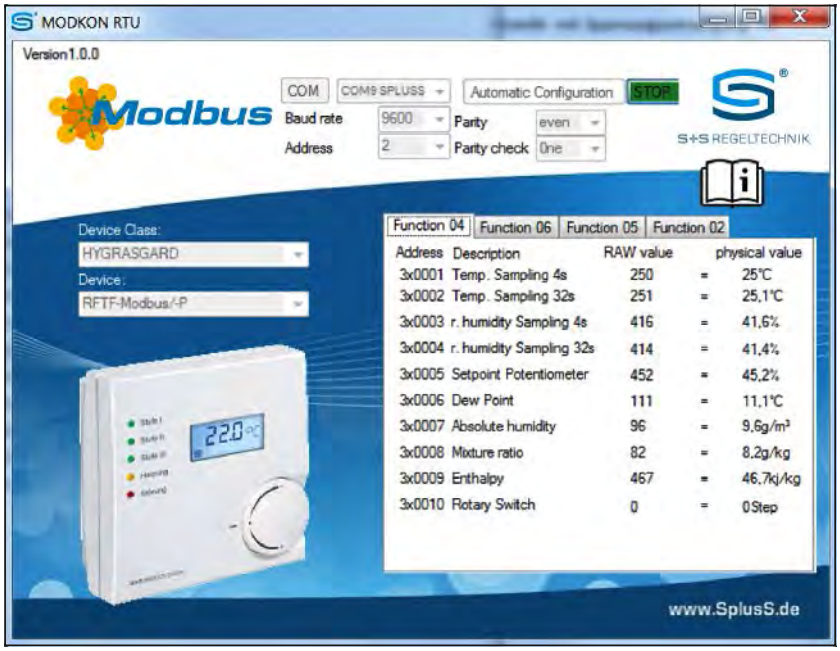


Fig. shows the input screen of the S+S software **MODKON RTU** (included in the scope of delivery) based on the example of the S+S Modbus sensor **HYGR**ASGARD® **RFTF-Modbus**

MODKON® KA2-Modbus Communication adapter incl. software				
Type / WG01	**Interfaces**	**Software**	**Item No.**	**Price**
KA 2 - Modbus				
KA2-Modbus	USB + RS485	MODKON RTU	1906-1200-0000-100	**220,41 €**
Note: You can find information on how to operate the software on the USB stick included or in the online shop.				

KYMASGARD® GW-wModbus

**Gateway with W-Modbus module,
for radio-based connection to Modbus networks**

S+S REGELTECHNIK

The gateway **KYM**ASGARD® **GW-wModbus** with Modbus connection and W-Modbus module, in an impact-resistant plastic housing with quick-locking screws, for on-wall installation, serves as a transition between wired Modbus and radio-based W-Modbus.

Up to 100 nodes can communicate with each other over a long distance of up to 500 metres (open field). An electrically isolated RS485 transceiver is used on the wired end (bus parameters can be set via DIP switches).

The simple **structure of the radio network** and the connection stability enable uncomplicated extension of existing systems with wireless W-Modbus sensors. Even mixed configurations of wired and wireless Modbus units can be easily integrated into existing network topologies via the W-Modbus gateway. Various operating modes are available for this purpose.

Gateway operation for connection to an existing Modbus topology or directly to a DDC, serves as a base station for W-Modbus sensors (max. 100 radio nodes).

Node operation enables the radio-based connection of a wired Modbus sensor to a W-Modbus network (max. 1 wired sensor).

Node Pro operation (extended node operation is optional) serves for the radio-based connection of several wired Modbus sensors (max. 16 wired nodes).

Thanks to the **innovative parametrisation** of the W-Modbus interface and the elimination of Modbus wiring, the entire W-Modbus network can be preconfigured (teaching the W-Modbus-nodes, assignment of gateway parameters). This means that the network can be installed and put into operation quickly and easily at the destination.

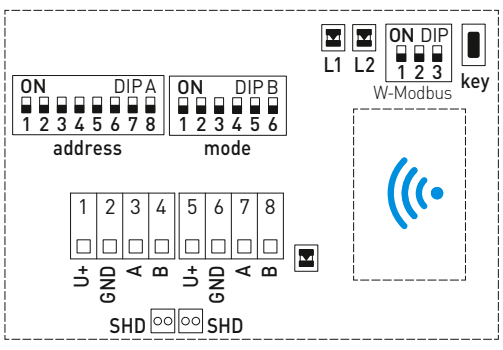
GW-wModbus



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.0 W / 24 VDC; < 1.4 VA / 24 VAC
Communication:	**Modbus RTU** (RS485 interface for RTU cable) **and** **W-Modbus** (Wireless Modbus with 2.4 GHz ISM)
Range:	max. 500 metres (open field) between two radio nodes
Nodes:	max. 100 radio nodes
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	Cable gland, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	–30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326, EMC directive 2014 / 30 / EU, Radio Directive ETSI 300 328 V2.2.2

Connection diagram **GW-wModbus**



DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
DIP W-Modbus: Operating mode (Gateway, Node...)

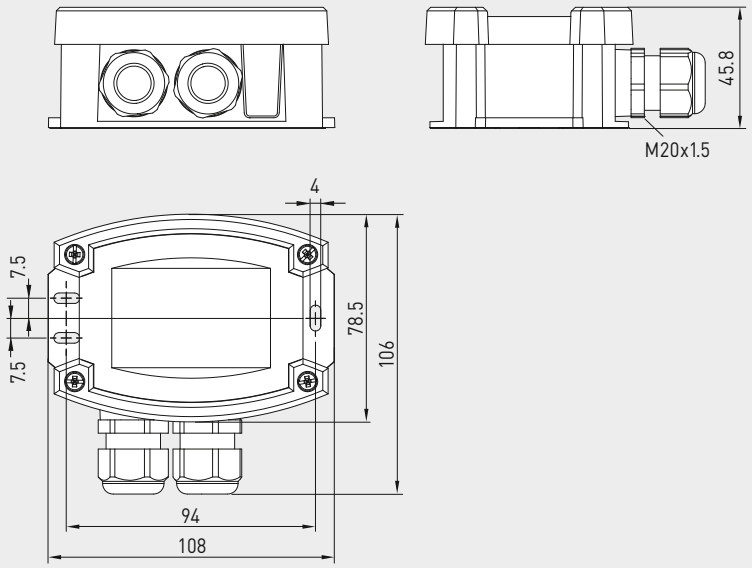
Teach-in key (**key**)
Network Status (**L1**)
Connection quality (**L2**)
Telegram indicator
Shielding (**SHD**)

For further technical information, see the operating instructions

Gateway with W-Modbus module,
for radio-based connection to Modbus networks

Dimensional drawing
[mm]

GW-wModbus

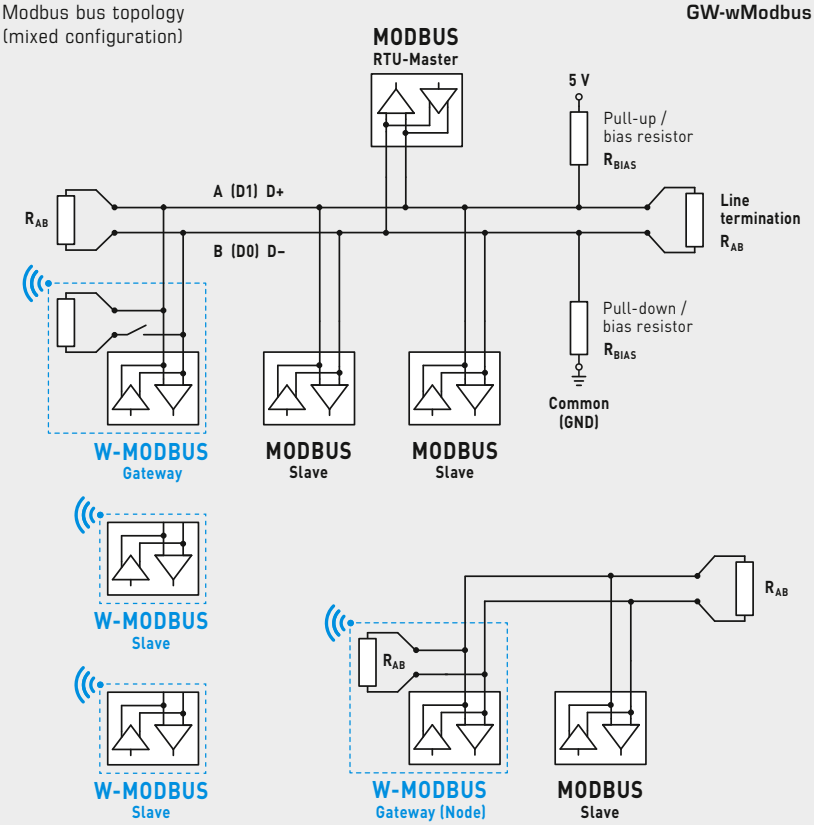


GW-wModbus



Modbus bus topology
(mixed configuration)

GW-wModbus



KYMKASGARD® **GW-wModbus**	Gateway with W-Modbus module, for radio-based connection to Modbus networks			
Type / WG02	**Communication**	**Operating modes**	**Item no.**	**Price**
GW-wModbus				
GW-wModbus	Modbus RTU / W-Modbus (Wireless)	Gateway + Node	1801-1211-1101-000	**229,00 €**
GW-wModbus **Pro**	Modbus RTU / W-Modbus (Wireless)	Gateway + Node **Pro**	1801-1211-1101-100	**310,00 €**
Note:	**"Pro"** extends node operation to a maximum of 16 wired nodes			

Temperature

THERMASGARD® **passive sensors** – tracking the perceived temperature

Our passive temperature sensors have proven themselves countless times in all temperature measurement applications. Technology and quality for precise measurement results you can rely on.

The units are available in a wide range of designs and individual variants to suit your requirements.

Application Areas

- Hospitals, museums, schools, hotels and administration buildings
- Power plants and district heating facilities
- Pharmaceutical and food industry
- Production plants
- Heating systems



S+S REGELTECHNIK



THERMASGARD®
PASSIVE TEMPERATURE SENSORS

Room sensors

DTF	In-ceiling temperature sensor	**199**
RTF	Room temperature sensor, on-wall	**182**
RTF 1	Room temperature sensor, on-wall	**184**
FSTF	Room temperature sensor, in-wall	**192**
FSTF 1	Room temperature sensor, in-wall	**193**
RPTF 1	Pendulum room temperature sensor	**256**
RPTF 2	Pendulum room temperature sensor	**257**
RSTF	Room radiation temperature sensor	**259**
RTF-xx	Room control units, on-wall	**186**
FSTF-xx	Room control units, in-wall	**194**

Outdoor sensor, on-wall sensor

ATF 01	Outside temperature sensor	**200**
ATF 1	Outside temperature sensor	**201**
ATF 2	Outside temperature sensor	**203**
ASTF	On-wall radiation temperature sensor	**258**

Duct sensors, surface-contact sensors

HTF	Sleeve temperature sensor with cable	**246**
OFTF	Surface temperature sensor	**251**
ALTF 1	Surface-contact temperature sensor with cable	**252**
ALTF 02	Surface-contact temperature sensor	**254**
ALTF 2	Surface-contact temperature sensor	**255**

Duct, immersion, screw-in sensors

TF 43	Duct / immersion / screw-in sensor	**208**
TF 65	Duct / immersion / screw-in sensor	**206**
TF 54	Duct / immersion / screw-in sensor	**220**
MWTF	Mean-value temperature sensor	**215**
MWTF-SD	Mean-value temperature sensor	**215**
ETF 6	Screw-in sensor with neck tube	**228**
ETF 7	Screw-in sensor, fast-acting	**217**
RGTF 2	Smoke gas screw-in sensor	**241**
RGTF 1	Smoke gas duct sensor	**235**
HTF	Duct / immersion / screw-in sensor with cable	**248**

Immersion sleeves and accessories

see chapter Accessories		**638**



Temperature

THERMASGARD® & **THERM**ASREG®
Sensor technology for heat and cold

Broad Spectrum

Our passive temperature sensors have a proven fit in countless applications across all areas of temperature measurement. Technology for best measuring results you can rely on. Available in various different models and individual versions to meet your precise requirements.

Optimum Precision

The devices are calibrated in-house in climate cabinets and are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Tested safety and certified quality

MANAGEMENT SYSTEM CERTIFIED ISO 9001 ISO 14001

- RoHS conforming materials
- ESD compliant manufacturing
- DIN tested / certified devices
- CE conformity
- UKCA conformity (UK Conformity Assessed)
- EAC certified
- GOST certified

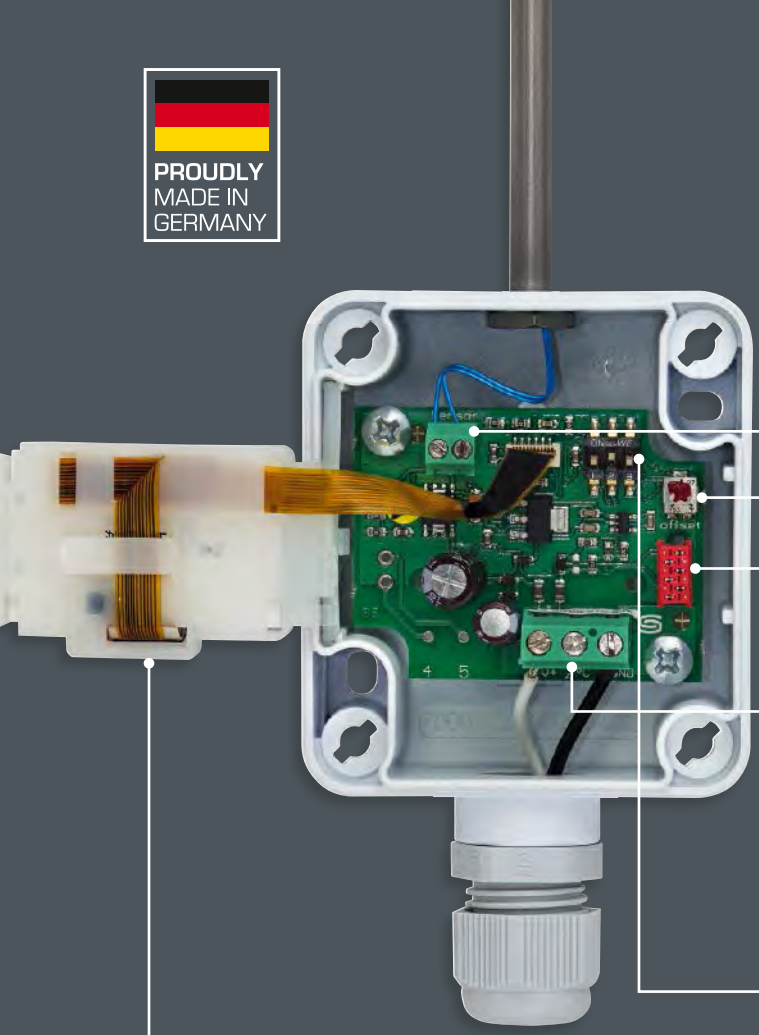
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

The **THERM**ASGARD® **1101-I** with current output (Test No. 69871-01939-1) and the **THERM**ASGARD® **1101-U** with voltage output (Test No. 69871-01940-1) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

THERMASREG® **ETR** and **KTR** are tested and certified to DIN EN 14597:2015-01.

PROUDLY MADE IN GERMANY

S+S REGELTECHNIK



1



Illuminated Display

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

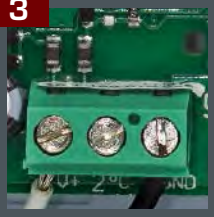
2



Sensors

Internal sensors / external sensors

3



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched as well as passive outputs (e.g. Pt1000, Ni1000 etc.)

4



DIP Switches

For multi-range toggling and setting of measuring ranges

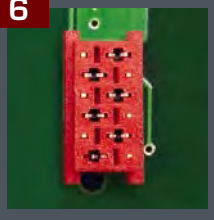
5



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

6



Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets







Configuration variants

Room temperature sensors and measuring transducers, on-wall, device series Baldur

S+S REGELTECHNIK

The room temperature sensors/measuring transducers serve for temperature measurement (in non-precipitating air), setpoint adjustment, presence detection or as a control panel with push-buttons, switches, potentiometers, status indicators (LED) in residential rooms, workshops, office and business facilities, and in the industrial sector.

Technical details for temperature measuring transducers see chapter "**Temperature sensor active**".

Here is a selection of equipment versions for room temperature sensors Special versions can be custom-made upon request.

DEVICE SERIES

Baldur 1 (85 x 85 x 27 mm)
Baldur 2 (98 x 98 x 33 mm)

Baldur lying



Baldur 1 without operating elements



Baldur 1 with display



Baldur 1 with display and potentiometer



Baldur 1 with potentiometer, push-button and LED



Baldur 1 with potentiometer and rocker switch



Baldur 1 with potentiometer and push-buttons



Baldur 1 with potentiometer and LEDs



Baldur 1 with potentiometer and LEDs



Baldur 1 with potentiometer and LEDs



Baldur 2 without operating elements



Baldur 2 with display



Baldur 2 with display, potentiometer and LEDs



Baldur 2 with LEDs and push-buttons



Baldur 2 with LEDs and push-buttons



Baldur 2 with potentiometer, turn switch and LEDs



Baldur 2 with potentiometer, turn switch and LEDs



Baldur 2 with potentiometer, push-buttons, LEDs and rocker switch



Baldur 2 with potentiometer, turn switch, LEDs and rocker switch



Baldur 2 with potentiometer and turn switch



Baldur 2 with potentiometer, turn switch, LEDs and push-buttons



Baldur 2 with potentiometer, turn switch, LEDs and push-buttons



THERMASGARD® RTF 1

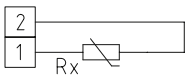
**Room temperature sensor,
on-wall, with passive output**

S+S REGELTECHNIK

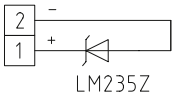
Room temperature sensor **THERM**ASGARD® **RTF 1** with passive output, in attractive plastic housing (Baldur 1) with snap-on enclosure cover, base with 4-hole attachment, for mounting on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry or in stainless steel housing (top and base made of stainless steel, screwed-on enclosure cover) as vandal-proof version e.g. for schools, barracks and public buildings.

This residential room temperature sensor is used to detect the temperature (–30 to +70 °C) in closed, dry rooms, in apartments, cinemas, supermarkets, storage rooms, office and business facilities.

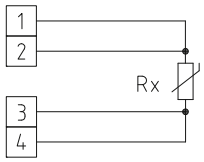
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)







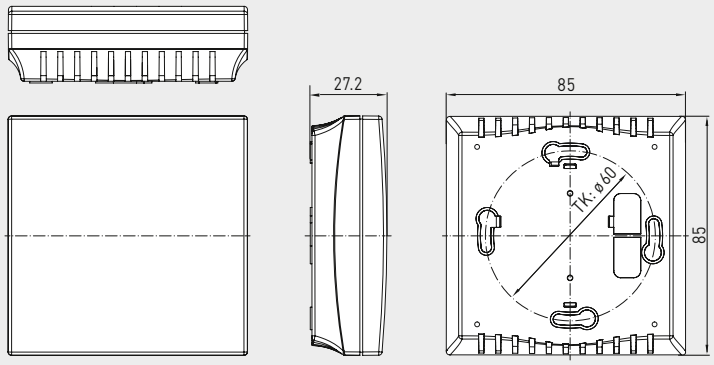
TECHNICAL DATA

Measuring range:	–30...+70 °C
Sensor / output:	passive, see table
Switching type:	2-wire connection (4-wire connection for Pt100 / Pt1000A, optional for other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optionally in stainless steel **V2A** (1.4301)
Dimension:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel **V2A** 1.4301)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top / bottom cable entry for surface-mounted installation
Electrical connection:	0.14–1.5 mm², via screw terminals, secured against unscrewing, only with safety extra-low voltage, max. 24 VDC
Process connection:	via screws
Permitted humidity:	max. 90 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)

THERMASGARD® **RTF 1**	Room temperature sensor (Standard)		
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
RTF1 xx		Baldur 1	
RTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1003-000	**24,05 €**
RTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5000-000	**26,75 €**
RTF1 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-40A0-6003-000	**28,58 €**
RTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9000-000	**26,38 €**
RTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0000-000	**26,38 €**
RTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1000-000	**24,67 €**
RTF1 NTC1,8K	NTC 1.8 K	1101-40A1-2000-000	**22,47 €**
RTF1 NTC10K	NTC 10K	1101-40A1-5000-000	**22,47 €**
RTF1 NTC20K	NTC 20K	1101-40A1-6000-000	**22,47 €**
Extra charge:	**Stainless steel housing** optional Other sensors optional	 on request	**112,97 €**

Dimensional drawing [mm]

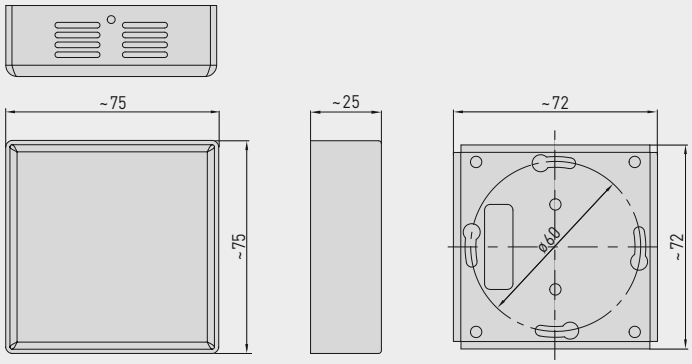
Housing **Baldur 1**



RTF 1
(Baldur 1)



Housing **stainless steel**

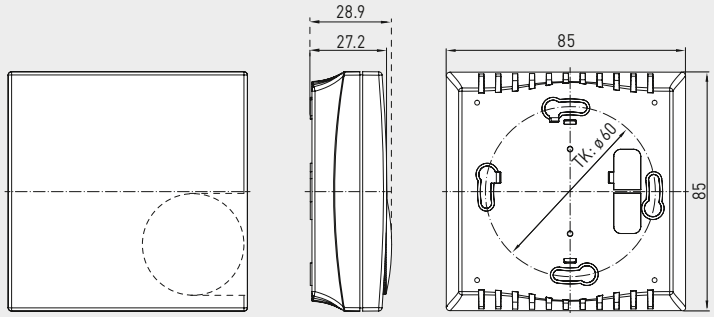


RTF 1
(stainless steel)



Dimensional drawing [mm]

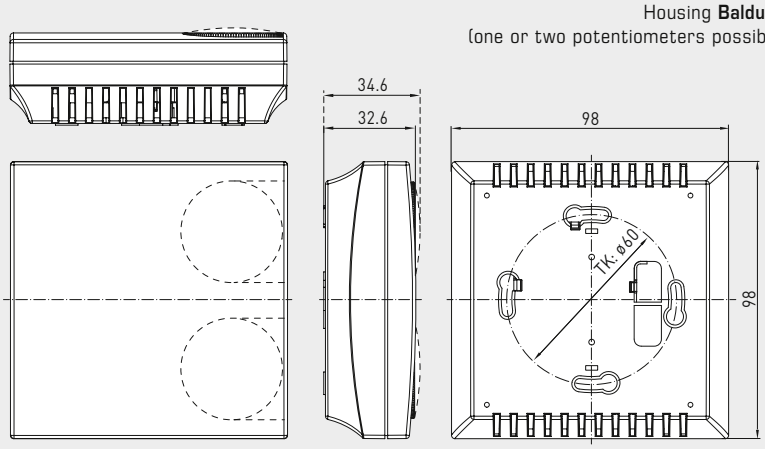
Housing **Baldur 1**
(only one potentiometer possible)



RTF xx
(Baldur 1)



Housing **Baldur 2**
(one or two potentiometers possible)



RTF xx
(Baldur 2)



Room temperature sensors / room control unit in different versions, on-wall, with passive output

S+S REGELTECHNIK

Room temperature sensor **THERM**ASGARD® **RTF xx** with passive output, in attractive plastic housing (Baldur 1 / Baldur 2) with snap-on enclosure cover, base with 4-hole attachment, for mounting on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. Available as a room control unit in various type versions with **control elements** such as setpoint potentiometer (%), rotary switch (max. 5-step), rocker switch, push-button or coloured **LEDs** for displaying the operating states.

This residential room temperature sensor is used to detect / display the temperature (–30…+70 °C) in closed, dry rooms, in apartments, in cinemas, supermarkets, storage rooms, office and business facilities.

TECHNICAL DATA

Measuring range:	–30…+70 °C
Sensor / output:	passive, see table
Switching type:	depending on type, see connection diagram
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA…5 mA (LM235Z)
Potentiometer:	Standard 1 kOhm, max. 0.1 W (other values optionally available upon request, e.g. 100 Ohm, 2.5 kOhm, 5 kOhm, 10 kOhm – units with active potentiometer **RTM xx**), with angle of rotation limiter
Rotary switch:	max. 24 V AC / DC, max. 130 mA, up to 5 switching speeds (0, Auto, I, II, III), with angle of rotation limiter
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-button:	NO contact, max. 24 VDC, max. 10 mA
LED:	max. 24 VDC (optionally max. 24 VAC), standard green and red (optionally red, yellow or two-tone)
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimension:	85 x 85 x 27 mm (Baldur 1) 98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Electrical connection:	0.14–1.5 mm², via screw terminals, only with safety extra-low voltage, max. 24 V DC
Process connection:	via screws
Permitted humidity:	max. 90 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)

RTF xx

Potentiometer / rotary switch
with angle of rotation limiter
(Fig. without rotary knob)




(1)


(2)



(3)

The standard **print** is a swelling arrow with centre position unfilled (**1**)

optionally wedge-shaped and unfilled (**2**)

or with marking points ±3K… +3K (**3**)

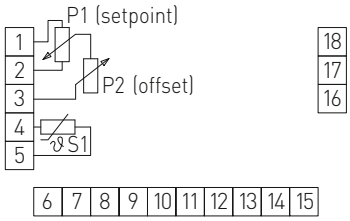
THERMASGARD® **RTF xx**	Room temperature sensor Baldur 1 / Baldur 2)
RTF xx	various equipment versions see type tables
Please specify with special orders:	**Ohm value** of potentiometer (standard is 1 kOhm; optionally 100 Ohm, 2.5 kOhm, 5 kOhm, 10 kOhm) **Swelling arrow type** (standard print is filled with centre position; optionally wedge-shaped or with marking points –3K… +3K) deviating **wiring requests** (available upon request)
Extra charge:	**unique special print** – see "Accessories" chapter
Note:	Unit versions with **active** potentiometer, see **RTM xx –** special versions available upon request



RTF xx P
(Baldur 1)

Version with sensor and potentiometer (1 kOhm, max. 0.1 W)

Connection diagram **RTF xx P**



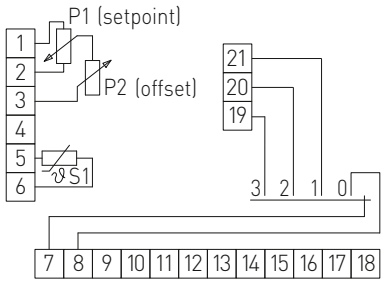
THERMASGARD® RTF xx P	Room temperature sensor with potentiometer		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx P		Baldur 1	
RTF Pt100 P	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1001-345	**48,50 €**
RTF Pt1000 P	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5001-345	**49,82 €**
RTF Ni1000 P	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9001-345	**51,14 €**
RTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0001-345	**51,82 €**
RTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1001-345	**49,82 €**
RTF NTC1,8K P	NTC 1,8 K	1101-40A1-2001-345	**49,96 €**
RTF NTC10K P	NTC 10K	1101-40A1-5001-345	**48,50 €**
RTF NTC20K P	NTC 20K	1101-40A1-6001-345	**48,50 €**
Note:	Unit versions with active potentiometer, see **RTM xx**		



RTF xx PD
(Baldur 2)

Version with sensor, potentiometer (1 kOhm, max. 0.1 W) and and turn switch (max. 24 V AC/DC, max. 130 mA)

Connection diagram **RTF xx PD**



THERMASGARD® RTF xx PD	Room temperature sensor with potentiometer and rotary switch		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx PD		Baldur 2	
RTF Pt100 P D4	Pt100 (according to DIN EN 60751, class B)	1101-40B0-1007-349	**54,95 €**
RTF Pt1000 P D4	Pt1000 (according to DIN EN 60751, class B)	1101-40B0-5007-349	**56,97 €**
RTF Ni1000 P D4	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40B0-9007-349	**57,29 €**
RTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40B1-0007-349	**59,67 €**
RTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40B2-1007-349	**59,01 €**
RTF NTC1,8K P D4	NTC 1,8 K	1101-40B1-2007-349	**59,12 €**
RTF NTC10K P D4	NTC 10K	1101-40B1-5007-349	**57,65 €**
RTF NTC20K P D4	NTC 20K	1101-40B1-6007-349	**57,65 €**
Note:	Special versions available upon request		

Room temperature sensors / room control unit in different versions, on-wall, with passive output

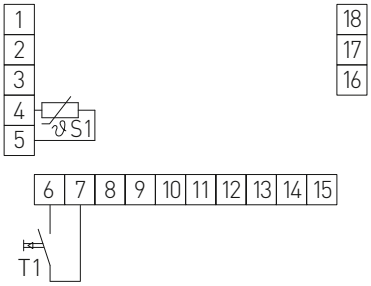
S+S REGELTECHNIK



RTF xx T
(Baldur 1)

Version with sensor and push-button (max. 24 V DC, max. 10 mA)

Connection diagram **RTF xx T**



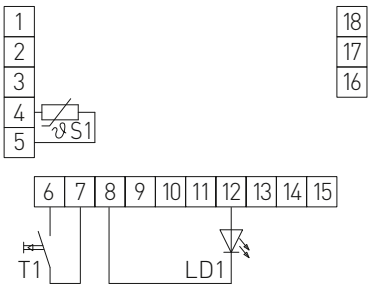
THERMASGARD® RTF xx T	Room temperature sensor with push-button		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx T		Baldur 1	
RTF Pt100 T	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1617-000	**45,89 €**
RTF Pt1000 T	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5617-000	**45,89 €**
RTF Ni1000 T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9617-000	**47,73 €**
RTF NiTK T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0617-000	**48,91 €**
RTF LM235Z T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1617-000	**48,39 €**
RTF NTC1,8K T	NTC 1,8 K	1101-40A1-2617-000	**48,66 €**
RTF NTC10K T	NTC 10K	1101-40A1-5617-000	**45,24 €**
RTF NTC20K T	NTC 20K	1101-40A1-6617-000	**45,24 €**
Note:	Special versions available upon request		



RTF xx LT
(Baldur 1)

Version with sensor, LED (green) and push-button (max. 24 V DC, max. 10 mA)

Connection diagram **RTF xx LT**



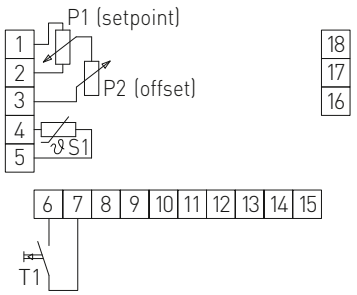
THERMASGARD® RTF xx LT	Room temperature sensor with LED and push-button		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx LT		Baldur 1	
RTF Pt100 L T	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1593-002	**48,50 €**
RTF Pt1000 L T	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5593-002	**50,27 €**
RTF Ni1000 L T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9593-002	**50,62 €**
RTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0593-002	**54,34 €**
RTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1593-002	**49,65 €**
RTF NTC1,8K L T	NTC 1,8 K	1101-40A1-2593-002	**54,03 €**
RTF NTC10K L T	NTC 10K	1101-40A1-5593-002	**48,97 €**
RTF NTC20K L T	NTC 20K	1101-40A1-6593-002	**48,97 €**
Note:	Special versions available upon request		



RTF xx PT
(Baldur 1)

Version with sensor, potentiometer (1 kOhm, max. 0.1 W) and push-button (max. 24 V DC, max. 10 mA)

Connection diagram **RTF xx PT**



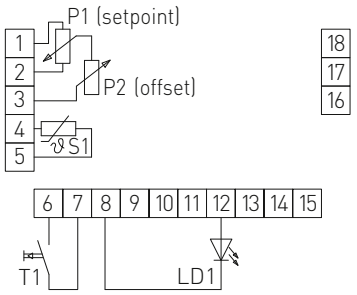
THERMASGARD® RTF xx PT	Room temperature sensor with potentiometer and push-button		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx PT		Baldur 1	
RTF Pt100 P T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1021-345	**53,64 €**
RTF Pt1000 P T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5021-345	**55,67 €**
RTF Ni1000 P T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9021-345	**56,00 €**
RTF NiTK P T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0021-345	**58,36 €**
RTF LM235Z P T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1021-345	**57,70 €**
RTF NTC1,8K P T	NTC 1,8 K	1101-40A1-2021-345	**57,81 €**
RTF NTC10K P T	NTC 10K	1101-40A1-5021-345	**56,32 €**
RTF NTC20K P T	NTC 20K	1101-40A1-6021-345	**56,32 €**
Note:	Special versions available upon request		



RTF xx PLT
(Baldur 1)

Version with sensor, potentiometer (1 kOhm, max. 0.1 W), LED (green) and push-button (max. 24 V DC, max. 10 mA)

Connection diagram **RTF xx PLT**



THERMASGARD® RTF xx PLT	Room temperature sensor with potentiometer, LED and push-button		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx PLT		Baldur 1	
RTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1663-347	**68,37 €**
RTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5663-347	**71,80 €**
RTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9663-347	**72,12 €**
RTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0663-347	**75,25 €**
RTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1663-347	**70,42 €**
RTF NTC1,8K P L T	NTC 1,8 K	1101-40A1-2663-347	**74,74 €**
RTF NTC10K P L T	NTC 10K	1101-40A1-5663-347	**68,37 €**
RTF NTC20K P L T	NTC 20K	1101-40A1-6663-347	**68,37 €**
Note:	Special versions available upon request		

Room temperature sensors / room control unit in different versions, on-wall, with passive output

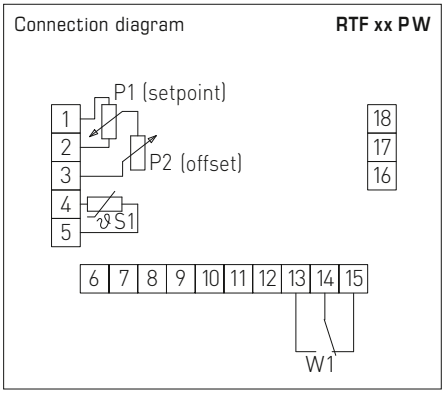
S+S REGELTECHNIK



RTF xx P W
(Baldur 1)

Version with sensor,
potentiometer (1 kOhm, max. 0.1 W) and
rocker switch (max. 24 V AC/DC, max. 130 mA)

Connection diagram **RTF xx P W**



THERMASGARD® RTF xx PW	Room temperature sensor with potentiometer and rocker switch		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
RTF xx P W		Baldur 1	
RTF Pt100 P W	Pt100 (according to DIN EN 60751, class B)	1101-40A0-1061-348	**54,43 €**
RTF Pt1000 P W	Pt1000 (according to DIN EN 60751, class B)	1101-40A0-5061-348	**56,38 €**
RTF Ni1000 P W	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-40A0-9061-348	**56,92 €**
RTF NiTK P W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0061-348	**59,01 €**
RTF LM235Z P W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1061-348	**58,36 €**
RTF NTC1,8K P W	NTC 1,8 K	1101-40A1-2061-348	**58,89 €**
RTF NTC10K P W	NTC 10K	1101-40A1-5061-348	**57,06 €**
RTF NTC20K P W	NTC 20K	1101-40A1-6061-348	**57,06 €**
Note:	Special versions available upon request		

Operating elements Baldur 1 — Possible combinations	1	2	3	4	5	6
Sensor 1	●	●	●	●	●	●
Sensor 2	●		●			
Sensor 3 LM235Z with calibrating pot (4-wire)	●			●	●	
Potentiometer 1 with / without series resistor	●	●	●	●		
Potentiometer 2 with calibrating pot					●	●
LED 1 (max. one LED)						
LED 2 (max. two LEDs)						
LED 3 (max. three LEDs)						
LED 4 (max. four LEDs)	●	●	●	●	●	●
Rocker switch		●	●			●
Push-button 1 (max. one button)	●		●		●	●
Push-button 2 (max. two buttons)		●		●		

With 4-conductor-circuitry, Sensor 3 is used, thus a maximum of 3 LEDs is possible.
LM235Z with calibrating pot = calibration of sensor output signal.
Satchwell switching possible with sensor 2.
Turn switches are not possible with Baldur 1!

Please specify in your order:
Ohm rating of potentiometer (e. g. 100 Ohm, 1 kOhm, 2.5 kOhm, 5 kOhm, 10 kOhm)
Colour of LED (e. g. green, red, yellow)
Printing, form of swelling arrow (wedge-shaped or with central position, points or numerical scale)
Requested features regarding operating and / or display elements and wiring
We offer special designs on request in written form including approval drawing.
Special printing: See last chapter "Accessories"

Operating elements Baldur 2 — Possible combinations	1	2	3	4	5	6	7	8	9	10
Sensor 1	●	●	●	●	●	●	●	●	●	●
Sensor 2 LM235Z with calibrating pot	●						●			
Sensor 3 with heat sink (4-wire)										
Potentiometer 1 (at bottom) with / without series resistor	●	●		●		●	●	●		●
Potentiometer 2 (at top)		●						●		
Key switch (at bottom)			●						●	
Turn switch 1 (at top) with / without series resistor				●						●
Turn switch 2 (at bottom)					●					
LED 1 (max. one LED)										
LED 2 (max. two LEDs)										
LED 3 (max. three LEDs)		●						●		
LED 4 (max. four LEDs)				●						●
LED 5 (max. five LEDs)	●		●		●		●		●	
LED 6 (max. six LEDs)						●				
Rocker switch	●	●	●	●	●	●				
Push-button 1 (max. one button)										
Push-button 2 (max. two buttons)	●	●	●		●	●				●
Push-button 3 (max. three buttons)										
Push-button 4 (max. four buttons)							●	●	●	

Sensor 3 can also be used instead of sensor 1.
LM235Z with calibrating pot = calibration of sensor output signal.
In the case cascade connections with turn switch 1, LEDs are not possible!
With the Baldur 2 housing, only one operating element is possible at each of the positions "(at bottom)" and "(at top)"!

Room temperature sensors
in-wall, panel switch programme,
general

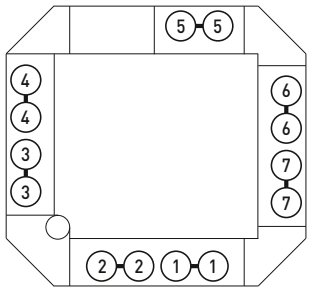
S+S REGELTECHNIK

A room temperature sensor **THERM**ASGARD® **FSTF** is used for air temperature measurement or setpoint adjustment, for presence detection or as room control and operating panel with temperature sensor, push-buttons, potentiometers, status indicators (LEDs).

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

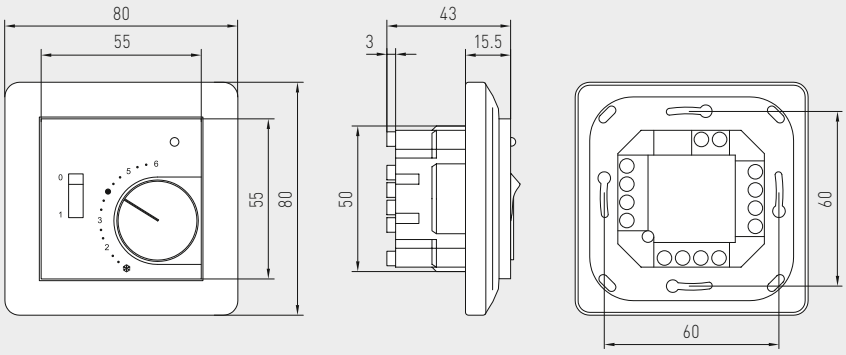
Circuit diagram **FSTF -xx**



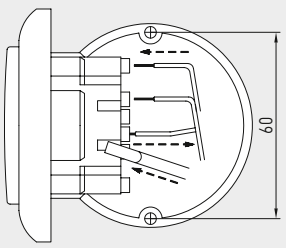
TECHNICAL DATA

Measuring ranges:	–30...+60 °C
Sensor / output:	see table, assembled on board, passive
Range suppression:	in the button
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Potentiometers:	standard 1 kΩ, max. 0.1 W (other ratings optional on request, e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ optional 0-10 V linear)
Turn switches:	max. 24 V AC / DC, max. 130 mA, max. 5 steps (0, Auto, I, II, III)
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-buttons:	normally open contact, max. 24 V DC / 10 mA
LEDs:	max. 24 V DC (optional max. 24 V AC), standard green (red, yellow or two-colour optional)
Installation:	in in-wall flush box Ø 55 mm
Electrical connection:	**FSTF-1** via screw terminals 0.14 - 1.5 mm², **FSTF xx** via plug terminals 1.0 - 2.5 mm²
Humidity:	max. 90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to EN 60 529)
SWITCH PROGRAMMES	
Manufacturer:	GIRA System 55 Standard (other switch programmes, manufacturers, and prices upon request)
Housing:	plastic, colour pure white glossy (similar to RAL 9010) (other colours are possible on request with colour variants depending on the respective switch programme)

Dimensional drawing **FSTF -xx**



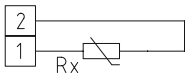
Installation scheme **FSTF -xx**



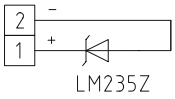


FSTF 1
Standard version
with sensor

1x two-wire connection
Standard



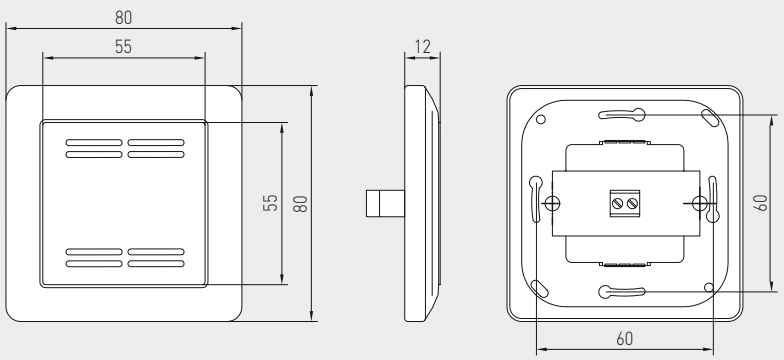
1x two-wire connection
LM 235 Z (KP 10)



THERMASGARD® FSTF 1 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF1	**passive**	**IP 20** (–30...+60 °C)	
FSTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1000-162	**52,31 €**
FSTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5000-162	**52,31 €**
FSTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9000-162	**53,88 €**
FSTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0000-162	**56,38 €**
FSTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1000-162	**52,46 €**
FSTF1 NTC1,8K	NTC 1.8 K	1101-5021-2000-162	**51,82 €**
FSTF1 NTC10K	NTC 10K	1101-5021-5000-162	**51,27 €**
FSTF1 NTC20K	NTC 20K	1101-5021-6000-162	**51,27 €**

Dimensional drawing **FSTF - 1**



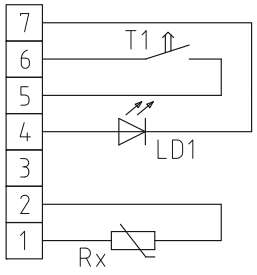
**Room temperature sensors
in-wall, panel switch programme,
different versions**

S+S REGELTECHNIK



FSTF xx LT
Version with sensor,
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

Connecting diagram **FSTF xx LT**



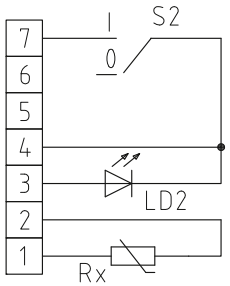
THERMASGARD® FSTF xx LT Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx LT	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 L T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1593-350	**68,86 €**
FSTF Pt1000 L T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5593-350	**68,86 €**
FSTF Ni1000 L T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9593-350	**70,80 €**
FSTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0593-350	**70,80 €**
FSTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1593-350	**69,49 €**
FSTF NTC1,8K L T	NTC 1.8 K	1101-5021-2593-350	**68,86 €**
FSTF NTC10K L T	NTC 10K	1101-5021-5593-350	**68,19 €**
FSTF NTC20K L T	NTC 20K	1101-5021-6593-350	**68,19 €**



FSTF xx LD2
Version with sensor,
LED (green), and turn switch (2-step)
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx LD2**



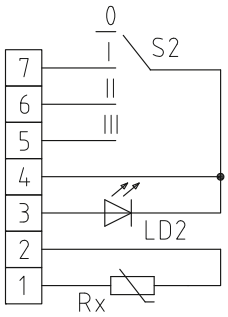
THERMASGARD® FSTF xx LD2 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx LD2	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 D2 L	Pt100 (according to DIN EN 60751, class B)	1101-5020-1631-351	**78,80 €**
FSTF Pt1000 D2 L	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5631-351	**78,80 €**
FSTF Ni1000 D2 L	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9631-351	**81,29 €**
FSTF NiTK D2 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0631-351	**81,29 €**
FSTF LM235Z D2 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1631-351	**79,33 €**
FSTF NTC1,8K D2 L	NTC 1.8 K	1101-5021-2631-351	**79,33 €**
FSTF NTC10K D2 L	NTC 10K	1101-5021-5631-351	**78,68 €**
FSTF NTC20K D2 L	NTC 20K	1101-5021-6631-351	**78,68 €**



FSTF xx LD4
Version with sensor,
LED (green) and turn switch (4-step)
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx LD4**



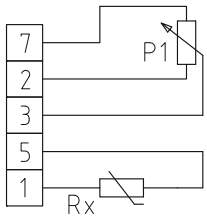
THERMASGARD® FSTF xx LD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx LD4	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 D4 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1643-352	**81,97 €**
FSTF Pt1000 D4 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5643-352	**81,97 €**
FSTF Ni1000 D4 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9643-352	**83,92 €**
FSTF NiTK D4 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0643-352	**83,92 €**
FSTF LM235Z D4 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1643-352	**82,62 €**
FSTF NTC1,8K D4 L	NTC 1.8 K	1101-5021-2643-352	**81,97 €**
FSTF NTC10K D4 L	NTC 10K	1101-5021-5643-352	**81,29 €**
FSTF NTC20K D4 L	NTC 20K	1101-5021-6643-352	**81,29 €**



FSTF xx P
Version with sensor
and potentiometer
(1 kOhm, max. 0.1 W)

Connecting diagram **FSTF xx P**



THERMASGARD® FSTF xx P Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx P	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1001-282	**84,57 €**
FSTF Pt1000 P	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5001-162	**84,57 €**
FSTF Ni1000 P	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9001-162	**85,38 €**
FSTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0001-162	**88,25 €**
FSTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1001-162	**80,64 €**
FSTF NTC1,8K P	NTC 1.8 K	1101-5021-2001-162	**81,97 €**
FSTF NTC10K P	NTC 10K	1101-5021-5001-162	**80,64 €**
FSTF NTC20K P	NTC 20K	1101-5021-6001-162	**80,64 €**

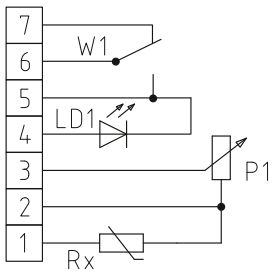
**Room temperature sensors
in-wall, panel switch programme,
different versions**

S+S REGELTECHNIK



FSTF xx PLW
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green), and rocker switch
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx PLW**



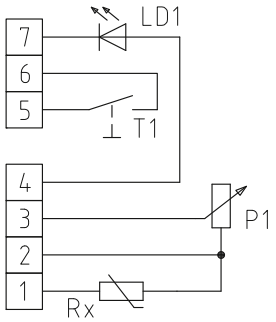
THERMASGARD® FSTF xx PLW Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PLW	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P L W	Pt100 (according to DIN EN 60751, class B)	1101-5020-1655-353	**107,33 €**
FSTF Pt1000 P L W	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5655-353	**110,02 €**
FSTF Ni1000 P L W	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9655-353	**110,67 €**
FSTF NiTK P L W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0655-353	**113,34 €**
FSTF LM235Z P L W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1655-353	**107,99 €**
FSTF NTC1,8K P L W	NTC 1.8 K	1101-5021-2655-353	**113,89 €**
FSTF NTC10K P L W	NTC 10K	1101-5021-5655-353	**107,33 €**
FSTF NTC20K P L W	NTC 20K	1101-5021-6655-353	**107,33 €**



FSTF xx PLT
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

Connecting diagram **FSTF xx PLT**



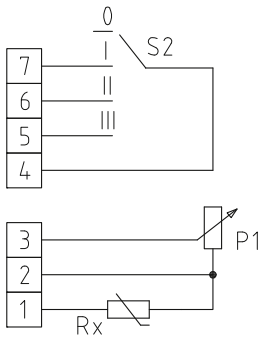
THERMASGARD® FSTF xx PLT Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PLT	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P L T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1663-162	**107,26 €**
FSTF Pt1000 P L T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5663-162	**109,95 €**
FSTF Ni1000 P L T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9663-350	**110,60 €**
FSTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0663-350	**113,29 €**
FSTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1663-350	**107,91 €**
FSTF NTC1,8K P L T	NTC 1.8 K	1101-5021-2663-350	**113,82 €**
FSTF NTC10K P L T	NTC 10K	1101-5021-5663-350	**107,26 €**
FSTF NTC20K P L T	NTC 20K	1101-5021-6663-350	**107,26 €**



FSTF xx PD4
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W)
and turn switch
(max. 24 V AC / DC, max. 130 mA)

Connecting diagram **FSTF xx PD4**



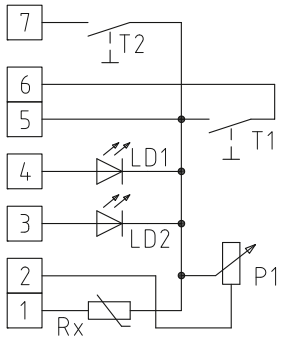
THERMASGARD® FSTF xx PD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx PD4	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1007-354	**110,61 €**
FSTF Pt1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5007-354	**113,30 €**
FSTF Ni1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9007-354	**113,97 €**
FSTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0007-354	**116,66 €**
FSTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1007-354	**110,61 €**
FSTF NTC1,8K P D4	NTC 1.8 K	1101-5021-2007-354	**112,61 €**
FSTF NTC10K P D4	NTC 10K	1101-5021-5007-354	**109,95 €**
FSTF NTC20K P D4	NTC 20K	1101-5021-6007-354	**109,95 €**



FSTF xx P 2L 2T
Version with sensor,
potentiometer (1 kOhm, max. 0.1 W),
2 LEDs (green, red), and 2 push-buttons (max.
24 V DC, max. 10 mA)

Connecting diagram **FSTF xx P 2L 2T**



THERMASGARD® FSTF xx P 2L 2T Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
FSTF xx P 2L 2T	**passive**	**IP 20** (–30...+60 °C)	
FSTF Pt100 P 2L 2T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1672-256	**113,29 €**
FSTF Pt1000 P 2L 2T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5672-256	**116,96 €**
FSTF Ni1000 P 2L 2T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9672-256	**120,76 €**
FSTF NiTK P2L2T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0672-256	**122,99 €**
FSTF LM235Z P 2L 2T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1672-256	**115,92 €**
FSTF NTC1,8K P 2L 2T	NTC 1.8 K	1101-5021-2672-256	**119,60 €**
FSTF NTC10K P 2L 2T	NTC 10K	1101-5021-5672-256	**113,82 €**
FSTF NTC20K P 2L 2T	NTC 20K	1101-5021-6672-256	**113,82 €**

S+S REGELTECHNIK

In-ceiling temperature sensors with passive output

THERMASGARD® **DTF** is a small in-ceiling resistance thermometer with passive output for in-wall installation, e.g. in plasterboard walls or suspended ceilings. The in-ceiling temperature sensor DTF is preferably installed in ceilings and walls, blends in seamlessly with the overall architectural design and detects the temperature at the surface.
The connecting head is pluggable for quick, easy mounting.

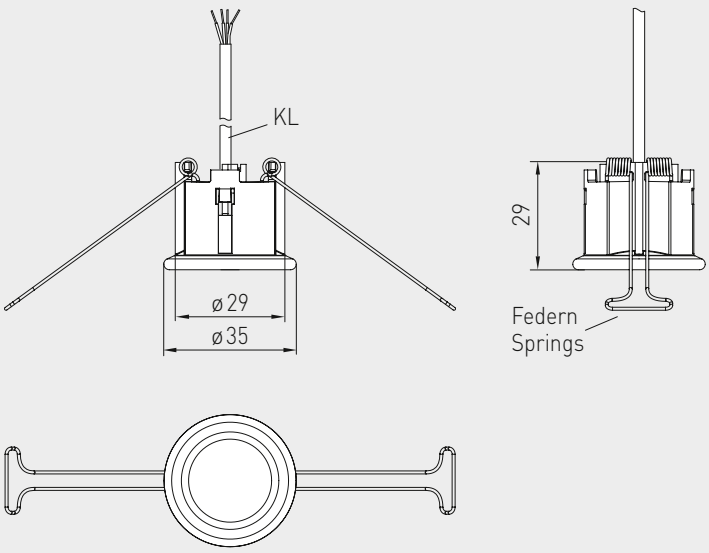
DTF
Connecting head, pluggable



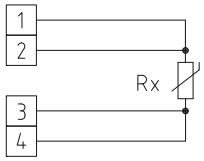
TECHNICAL DATA

Measuring range:	–20...+90 °C
Sensors / output:	see table, passive
Connection type:	4-wire connection **terminal 1 / 2: +** (marked red, wire colours: yellow, brown) **terminal 3 / 4: –** (marked black, wire colours: white, green)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting head:	plastic, material polycarbonate (PC), colour white (can be painted as an option), **pluggable**
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², KL = approx. 2 m
Process connection:	inside suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according EN 60 529) Sensor in the built-in state

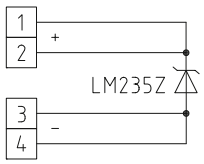
Dimensional drawing **DTF**



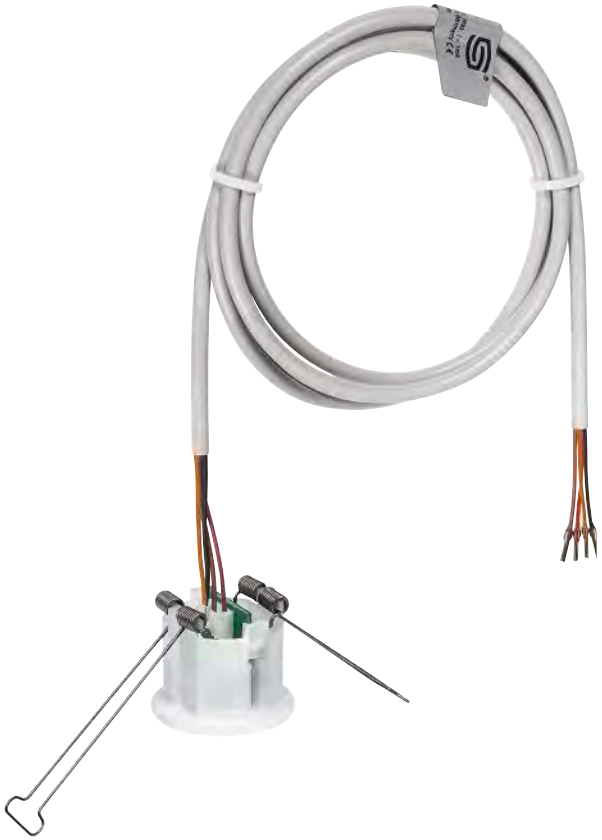
1x four-wire connection
standard



1x four-wire connection
LM 235 Z (KP 10)



DTF



THERMASGARD® DTF	In-ceiling temperature sensors		
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
DTF		**IP 30**	
DTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-60C0-1003-000	**41,96 €**
DTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-60C0-5003-000	**41,96 €**
DTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-60C0-9003-000	**41,69 €**
DTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-60C1-0003-000	**45,78 €**
DTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-60C2-1003-000	**42,94 €**
DTF NTC1,8K	NTC 1.8 K	1101-60C1-2003-000	**42,94 €**
DTF NTC10K	NTC 10K	1101-60C1-5003-000	**42,94 €**
DTF NTC20K	NTC 20K	1101-60C1-6003-000	**42,94 €**
Note:	Other sensors optional	on request	

THERMASGARD® ATF 1
THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors with passive output

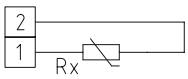
S+S REGELTECHNIK

Outside wall resistance thermometer / weather sensor **THERM**ASGARD® **ATF 1** (internal sensor) with passive output, housing made of impact-resistant plastic and quick-locking screws.

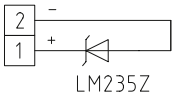
Outside wall resistance thermometer / weather sensor **THERM**ASGARD® **ATF 01** (internal sensor) with passive output, housing made of impact-resistant plastic and snap-on lid.

It is used to measure outside temperatures, temperatures in wet room areas, e.g. as an outdoor sensor, weather sensor for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory).

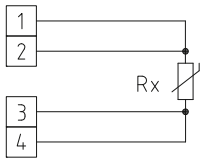
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP10)



1x four-wire connection
(optional)





TECHNICAL DATA

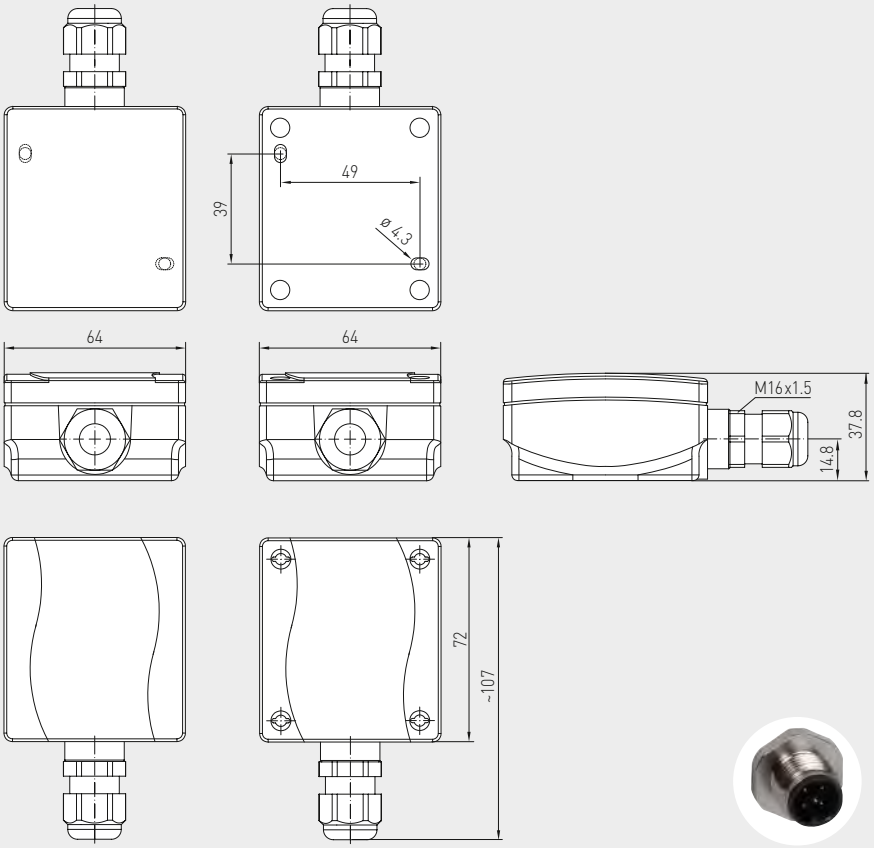
Measuring range:	–50...+90 °C
Sensors / output:	passive (see table), sensors internal
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), **ATF 01 with snap-on lid,** **ATF 1 with quick-locking screws** (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**ATF 01 IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **ATF 1 IP 67** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

THERMASGARD® ATF 01 Outside temperature sensors / wet room temperature sensors, *Standard* with snap-on lid

Type / WG03	Sensor / Output	Item No.	Price
ATF 01		**IP 54**	
ATF01 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1030-1003-000	**15,75 €**
ATF01 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1030-5001-000	**18,44 €**
ATF01 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1030-9001-000	**19,26 €**
ATF01 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1031-0001-000	**22,35 €**
ATF01 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1032-1001-000	**16,23 €**
ATF01 NTC1,8K	NTC 1.8 K	1101-1031-2001-000	**14,96 €**
ATF01 NTC10K	NTC 10K	1101-1031-5001-000	**14,96 €**
ATF01 NTC20K	NTC 20K	1101-1031-6001-000	**14,96 €**
Extra charge:	Other sensors optional Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	
ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information see last chapter!		

Dimensional drawing

ATF 1
ATF 01



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)

ATF 01
with snap-on lid
(IP 54)



ATF 1
with quick-locking screws
(IP 67)



THERMASGARD® ATF 1	Outside temperature sensors / wet room temperature sensors, *Premium* with quick-locking screws		
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ATF 1		**IP 67**	
ATF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1040-1003-000	**18,20 €**
ATF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1040-5001-000	**20,89 €**
ATF1 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1040-6003-000	**24,42 €**
ATF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1040-9001-000	**20,39 €**
ATF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1041-0001-000	**24,80 €**
ATF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1042-1001-000	**18,67 €**
ATF1 NTC1,8K	NTC 1.8 K	1101-1041-2001-000	**16,61 €**
ATF1 NTC10K	NTC 10K	1101-1041-5001-000	**16,61 €**
ATF1 NTC20K	NTC 20K	1101-1041-6001-000	**16,61 €**
Extra charge::	Other sensors optional Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	
ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information see last chapter!		

THERMASGARD® ATF 2

Outside temperature sensors / wet room temperature sensors with passive output

S+S REGELTECHNIK

Outside wall resistance thermometers / weather sensors **THERM**ASGARD® **ATF 2** (external sensor) with passive output and housing made of impact-resistant plastic and with quick-locking screws.

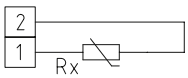
It is used to measure outside temperatures, temperatures in wet room areas, e.g. as a weather sensor, for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Outdoor installation should preferably be performed at the north side of a building or in a protected place.

In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory) or the device version with installed sun protection hood **SS02** (available upon request).

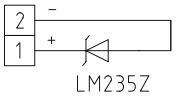
TECHNICAL DATA

Measuring range:	–50...+90 °C
Sensors / output:	passive (see table), sensor inside external sensor tube, stainless steel **V4A** (1.4571) (**Perfect Sensor Protection**)
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Optional:	with sun protection hood **SS 02** (available on request)

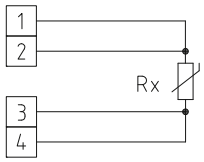
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)





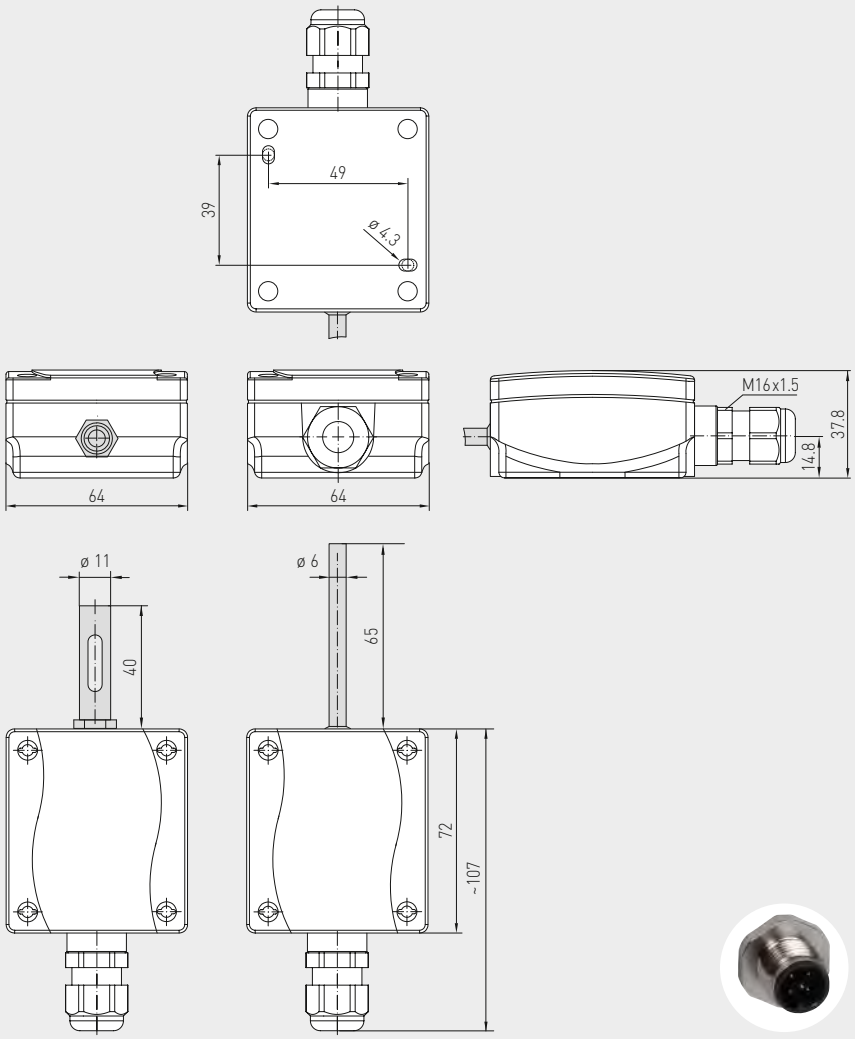


High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Dimensional drawing

ATF 2



with SS-02

without SS-02

M12 connector
(optional on request)

ATF 2



ATF 2
with SS-02



THERMASGARD® ATF 2 Outside temperature sensors / wet room temperature sensors			
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ATF 2			
ATF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1050-1003-000	**39,70 €**
ATF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1050-5001-000	**39,70 €**
ATF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1050-6003-000	**49,30 €**
ATF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1050-9001-000	**42,01 €**
ATF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1051-0001-000	**42,01 €**
ATF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1052-1001-000	**39,09 €**
ATF2 NTC1,8K	NTC 1.8 K	1101-1051-2001-000	**38,29 €**
ATF2 NTC10K	NTC 10K	1101-1051-5001-000	**38,29 €**
ATF2 NTC20K	NTC 20K	1101-1051-6001-000	**38,29 €**
Extra charge:	Other sensors optional with sun protection hood **SS 02** Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request on request	**10,03 €**
ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information see last chapter!		

THERMASGARD® TF 43
THERMASGARD® TF 65

Immersion / screw-in / duct temperature sensors with passive output

S+S REGELTECHNIK

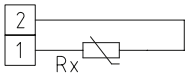
Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

THERMASGARD® **TF 43** is a resistance thermometer with a passive output, housing made from impact-resistant plastic with snap-on lid, and straight protective tube.

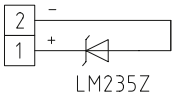
THERMASGARD® **TF 65** is a resistance thermometer with a passive output, housing made from impact-resistant plastic with quick-locking screws, and straight protective tube.

These immersion / screw-in / duct temperature sensors are electric contact thermometers for temperature measurement in liquids and gases, which are installed for example in piping systems and vessels. For aggressive media, stainless steel immersion sleeves must be used.
Applications of these temperature sensors in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

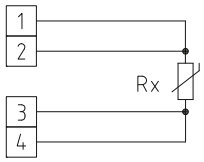
1x two-wire connection
Standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)



TECHNICAL DATA

Measuring range:	–30...+150 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	–20...+100 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016) **TF 43 with snap-on lid** **TF 65 with quick-locking screws** (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Protective tube:	stainless steel, **V4A** (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**TF 43 IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **TF 65 IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state





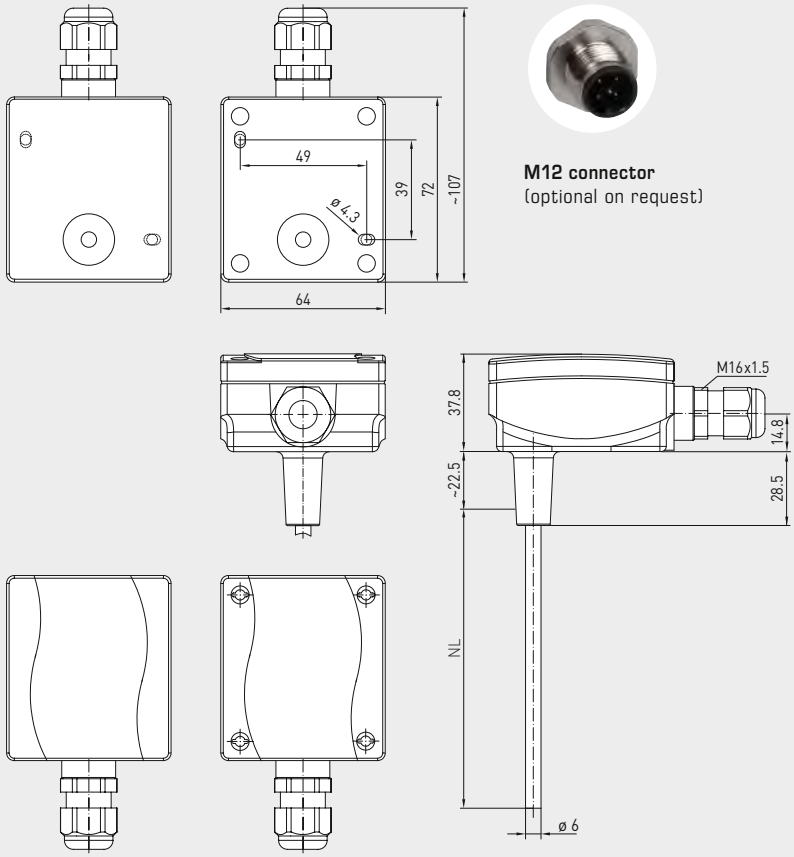
ACCESSORIES	
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, T_{max} = +100 °C
TH 08-ms / xx	**Immersion sleeve, brass, nickel-plated / galvanised** Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH 08-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH 08-VA / xx / 90	**Immersion sleeve, stainless steel, V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Dimensional drawing

TF 43
TF 65



M12 connector
(optional on request)

with snap-on lid

with quick-locking screws

TF 43
with snap-on lid
(IP 54)



TF 65
with quick-locking screws
(IP 67)



PATENTED



TF xx
Basic device
with accessories

THERMASGARD® TF 65	Temperature sensors (Basic device with quick-locking screws), *Premium*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF65 PT100 xx	**Pt100**	**IP 67**	
TF65 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1013-000	**38,95 €**
TF65 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1023-000	**40,54 €**
TF65 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1033-000	**42,14 €**
TF65 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1043-000	**42,76 €**
TF65 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1053-000	**44,70 €**
TF65 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1063-000	**46,16 €**
TF65 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1073-000	**47,01 €**
TF65 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1083-000	**48,13 €**
TF65 PT1000 xx	**Pt1000**	**IP 67**	
TF65 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5011-000	**41,64 €**
TF65 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5021-000	**43,24 €**
TF65 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5031-000	**44,82 €**
TF65 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5041-000	**45,42 €**
TF65 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5051-000	**47,39 €**
TF65 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5061-000	**48,85 €**
TF65 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5071-000	**49,46 €**
TF65 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5081-000	**50,32 €**
TF65 PT1000A xx	**Pt1000A**	**IP 67**	
TF65 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6013-000	**43,64 €**
TF65 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6023-000	**44,34 €**
TF65 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6033-000	**46,66 €**
TF65 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6043-000	**47,27 €**
TF65 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6053-000	**49,22 €**
TF65 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6063-000	**50,80 €**
TF65 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6073-000	**52,39 €**
TF65 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6083-000	**52,62 €**
TF65 Ni1000 xx	**Ni 1000**	**IP 67**	
TF65 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9011-000	**40,91 €**
TF65 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9021-000	**42,87 €**
TF65 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9031-000	**44,45 €**
TF65 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9041-000	**45,06 €**
TF65 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9051-000	**47,01 €**
TF65 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9061-000	**48,47 €**
TF65 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9071-000	**49,46 €**
TF65 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9081-000	**50,08 €**
TF65 NI1000TK xx	**Ni1000 TK5000**	**IP 67**	
TF65 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0011-000	**40,91 €**
TF65 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0021-000	**42,87 €**
TF65 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0031-000	**44,45 €**
TF65 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0041-000	**45,06 €**
TF65 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0051-000	**47,01 €**
TF65 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0061-000	**48,47 €**
TF65 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0071-000	**49,46 €**
TF65 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7021-0081-000	**45,71 €**

Continued on next page...

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TF 65	Temperature sensors (Basic device with quick-locking screws), *Premium*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF 65 LM235Z xx	**LM235Z**	**IP 67**	
TF65 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1011-000	**39,56 €**
TF65 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1021-000	**41,04 €**
TF65 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1031-000	**42,62 €**
TF65 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1041-000	**43,24 €**
TF65 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1051-000	**45,30 €**
TF65 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1061-000	**46,77 €**
TF65 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1071-000	**47,63 €**
TF65 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1081-000	**48,23 €**
TF 65 NTC 1.8 K xx	**NTC 1.8 K**	**IP 67**	
TF65 NTC1,8K 50mm	NTC 1.8 K	1101-7021-2011-000	**37,38 €**
TF65 NTC1,8K 100mm	NTC 1.8 K	1101-7021-2021-000	**38,95 €**
TF65 NTC1,8K 150mm	NTC 1.8 K	1101-7021-2031-000	**40,54 €**
TF65 NTC1,8K 200mm	NTC 1.8 K	1101-7021-2041-000	**41,04 €**
TF65 NTC1,8K 250mm	NTC 1.8 K	1101-7021-2051-000	**43,10 €**
TF65 NTC1,8K 300mm	NTC 1.8 K	1101-7021-2061-000	**44,57 €**
TF65 NTC1,8K 350mm	NTC 1.8 K	1101-7021-2071-000	**45,37 €**
TF65 NTC1,8K 400mm	NTC 1.8 K	1101-7021-2081-000	**46,41 €**
TF 65 NTC10K xx	**NTC 10K**	**IP 67**	
TF65 NTC10K 50mm	NTC 10K	1101-7021-5011-000	**37,38 €**
TF65 NTC10K 100mm	NTC 10K	1101-7021-5021-000	**38,95 €**
TF65 NTC10K 150mm	NTC 10K	1101-7021-5031-000	**40,54 €**
TF65 NTC10K 200mm	NTC 10K	1101-7021-5041-000	**41,04 €**
TF65 NTC10K 250mm	NTC 10K	1101-7021-5051-000	**43,10 €**
TF65 NTC10K 300mm	NTC 10K	1101-7021-5061-000	**44,57 €**
TF65 NTC10K 350mm	NTC 10K	1101-7021-5071-000	**45,37 €**
TF65 NTC10K 400mm	NTC 10K	1101-7021-5081-000	**46,41 €**
TF 65 NTC20K xx	**NTC 20K**	**IP 67**	
TF65 NTC20K 50mm	NTC 20K	1101-7021-6011-000	**37,38 €**
TF65 NTC20K 100mm	NTC 20K	1101-7021-6021-000	**38,95 €**
TF65 NTC20K 150mm	NTC 20K	1101-7021-6031-000	**40,54 €**
TF65 NTC20K 200mm	NTC 20K	1101-7021-6041-000	**41,04 €**
TF65 NTC20K 250mm	NTC 20K	1101-7021-6051-000	**42,98 €**
TF65 NTC20K 300mm	NTC 20K	1101-7021-6061-000	**44,57 €**
TF65 NTC20K 350mm	NTC 20K	1101-7021-6071-000	**45,37 €**
TF65 NTC20K 400mm	NTC 20K	1101-7021-6081-000	**46,41 €**
Note:	Other sensors optional	on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request	

TF 65
with quick-locking screws
(IP 67)



S+S REGELTECHNIK

Immersion / screw-in / duct temperature sensors with passive output

THERMASGARD® TF 43	Temperature sensors (Basic device with snap-on lid), *Standard*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF43 PT100 xx	**Pt100**	**IP 54**	
TF43 Pt100 50mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1013-000	**29,12 €**
TF43 Pt100 100mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1023-000	**29,24 €**
TF43 Pt100 150mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1033-000	**30,18 €**
TF43 Pt100 200mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1043-000	**31,01 €**
TF43 Pt100 250mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1053-000	**32,60 €**
TF43 Pt100 300mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1063-000	**35,28 €**
TF43 Pt100 350mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1073-000	**36,36 €**
TF43 Pt100 400mm	Pt100 (according to DIN EN 60751, class B)	1101-7010-1083-000	**37,51 €**
TF43 PT1000 xx	**Pt1000**	**IP 54**	
TF43 Pt1000 50mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5011-000	**29,12 €**
TF43 Pt1000 100mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5021-000	**29,24 €**
TF43 Pt1000 150mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5031-000	**30,18 €**
TF43 Pt1000 200mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5041-000	**31,01 €**
TF43 Pt1000 250mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5051-000	**32,60 €**
TF43 Pt1000 300mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5061-000	**35,28 €**
TF43 Pt1000 350mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5071-000	**36,36 €**
TF43 Pt1000 400mm	Pt1000 (according to DIN EN 60751, class B)	1101-7010-5081-000	**37,51 €**
TF43 PT1000A xx	**Pt1000A**	**IP 54**	
TF43 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6013-000	**30,94 €**
TF43 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6023-000	**31,09 €**
TF43 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6033-000	**32,00 €**
TF43 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6043-000	**32,85 €**
TF43 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6053-000	**34,42 €**
TF43 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6063-000	**37,11 €**
TF43 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6073-000	**38,20 €**
TF43 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6083-000	**39,36 €**
TF43 Ni1000 xx	**Ni 1000**	**IP 54**	
TF43 Ni1000 50mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9011-000	**29,84 €**
TF43 Ni1000 100mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9021-000	**32,66 €**
TF43 Ni1000 150mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9031-000	**32,90 €**
TF43 Ni1000 200mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9041-000	**33,62 €**
TF43 Ni1000 250mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9051-000	**34,57 €**
TF43 Ni1000 300mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9061-000	**36,84 €**
TF43 Ni1000 350mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9071-000	**37,89 €**
TF43 Ni1000 400mm	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-7010-9081-000	**39,59 €**
TF43 NI1000TK xx	**Ni1000 TK5000**	**IP 54**	
TF43 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0011-000	**29,89 €**
TF43 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0021-000	**32,72 €**
TF43 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0031-000	**33,06 €**
TF43 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0041-000	**33,76 €**
TF43 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0051-000	**34,68 €**
TF43 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0061-000	**36,99 €**
TF43 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0071-000	**38,14 €**
TF43 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-7011-0081-000	**39,74 €**

Continued on next page...

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® TF 43	Temperature sensors (Basic device with snap-on lid), *Standard*		
Type / WG03 / EL	**Sensor / Output**	**Item No.**	**Price**
TF 43 LM235Z xx	**LM235Z**	**IP 54**	
TF43 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1011-000	**30,43 €**
TF43 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1021-000	**30,76 €**
TF43 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1031-000	**31,87 €**
TF43 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1041-000	**32,60 €**
TF43 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1051-000	**32,97 €**
TF43 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1061-000	**35,80 €**
TF43 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1071-000	**36,24 €**
TF43 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1081-000	**38,50 €**
TF 43 NTC 1.8 K xx	**NTC 1.8 K**	**IP 54**	
TF43 NTC1,8K 50mm	NTC 1.8 K	1101-7011-2011-000	**29,12 €**
TF43 NTC1,8K 100mm	NTC 1.8 K	1101-7011-2021-000	**30,69 €**
TF43 NTC1,8K 150mm	NTC 1.8 K	1101-7011-2031-000	**31,48 €**
TF43 NTC1,8K 200mm	NTC 1.8 K	1101-7011-2041-000	**32,21 €**
TF43 NTC1,8K 250mm	NTC 1.8 K	1101-7011-2051-000	**33,76 €**
TF43 NTC1,8K 300mm	NTC 1.8 K	1101-7011-2061-000	**34,88 €**
TF43 NTC1,8K 350mm	NTC 1.8 K	1101-7011-2071-000	**36,06 €**
TF43 NTC1,8K 400mm	NTC 1.8 K	1101-7011-2081-000	**36,99 €**
TF 43 NTC10K xx	**NTC 10K**	**IP 54**	
TF43 NTC10K 50mm	NTC 10K	1101-7011-5011-000	**29,12 €**
TF43 NTC10K 100mm	NTC 10K	1101-7011-5021-000	**30,69 €**
TF43 NTC10K 150mm	NTC 10K	1101-7011-5031-000	**31,48 €**
TF43 NTC10K 200mm	NTC 10K	1101-7011-5041-000	**32,21 €**
TF43 NTC10K 250mm	NTC 10K	1101-7011-5051-000	**33,76 €**
TF43 NTC10K 300mm	NTC 10K	1101-7011-5061-000	**34,88 €**
TF43 NTC10K 350mm	NTC 10K	1101-7011-5071-000	**36,06 €**
TF43 NTC10K 400mm	NTC 10K	1101-7011-5081-000	**36,99 €**
TF43 NTC20K xx	**NTC 20K**	**IP 54**	
TF43 NTC20K 50mm	NTC 20K	1101-7011-6011-000	**29,12 €**
TF43 NTC20K 100mm	NTC 20K	1101-7011-6021-000	**30,69 €**
TF43 NTC20K 150mm	NTC 20K	1101-7011-6031-000	**31,48 €**
TF43 NTC20K 200mm	NTC 20K	1101-7011-6041-000	**32,21 €**
TF43 NTC20K 250mm	NTC 20K	1101-7011-6051-000	**33,76 €**
TF43 NTC20K 300mm	NTC 20K	1101-7011-6061-000	**34,88 €**
TF43 NTC20K 350mm	NTC 20K	1101-7011-6071-000	**36,06 €**
TF43 NTC20K 400mm	NTC 20K	1101-7011-6081-000	**36,99 €**
Note	Other sensors optional	on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request	

TF 43
with snap-on lid
(IP 54)



One basic device in four variants ...





PATENTED
DE 10 2012 017 500.0





TFxx +
TH08-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated / galvanised

TFxx +
TH08-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A

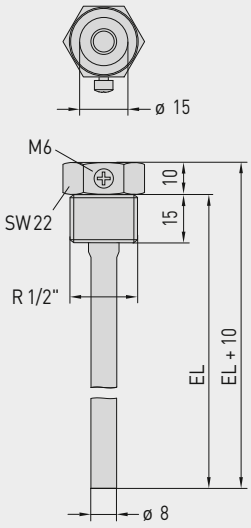
TFxx +
TH08-VA/xx/90

Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A

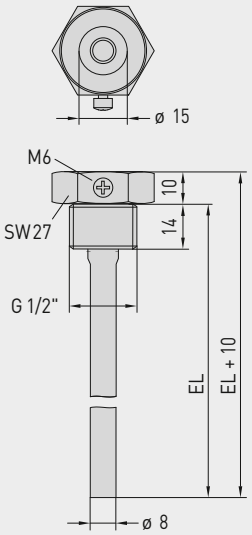
TFxx +
MF-15-K

Duct temperature sensor with mounting flange, plastic

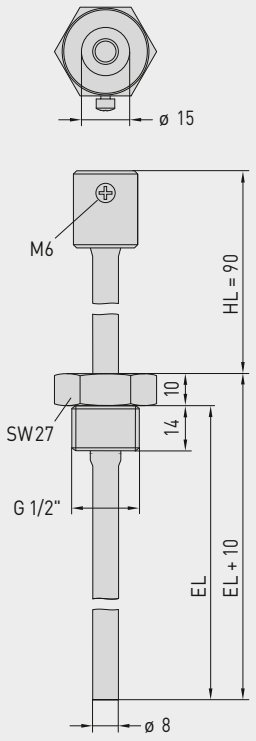
Dimensional drawing
TH08-ms/xx



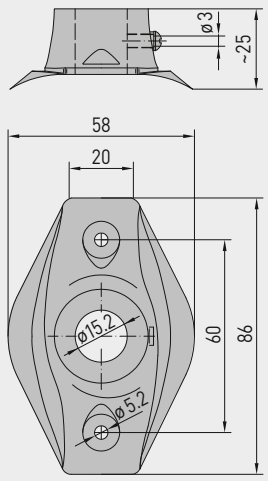
Dimensional drawing
TH08-VA/xx



Dimensional drawing
TH08-VA/xx/90



Dimensional drawing
MF-15-K



...through combination with accessories:



TH08-ms/xx
Immersion sleeve,
brass, nickel-plated / galvanised,
thread-sealing, conical,
according to DIN 10226



TH08-VA/xx
Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH08-VA/xx/90
Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-15-K
Mounting flange,
plastic

THERMASGARD® TH08	Immersion sleeve Ø 8 mm (Accessories)				
Type / WG01B	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH08-ms/xx	**Brass nickel-plated / galvanised**			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**12,90 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**13,50 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**14,60 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**15,62 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**18,09 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**18,90 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**19,40 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**19,90 €**
TH08-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**22,24 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**24,50 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**26,50 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**27,80 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**34,60 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**36,20 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**36,90 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**37,90 €**
TH08-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,91 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**31,26 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**32,80 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**34,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**35,83 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**38,84 €**
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mounting flange (Accessories)				
Type / WG01B		**T_{max}**	**Item No.**	**Price**
MF				
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland	+100 °C	7100-0032-0000-000	**6,30 €**
Note:	For further information see last chapter!			

THERMASGARD® MWTF
THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor including mounting flange, with passive output

S+S REGELTECHNIK



MWTF
Rod length 0,4 m
(IP 65)

Mean-value temperature sensor **THERM**ASGARD® **MWTF** (rod sensor 0.4...20 m) with passive output, in an impact-resistant plastic housing with quick-locking screws, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange.

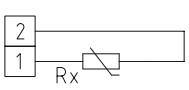
Mean-value temperature sensor **THERM**ASGARD® **MWTF-SD** (rod sensor 3 m / 6 m) with passive output, in an impact-resistant plastic housing with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange.

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

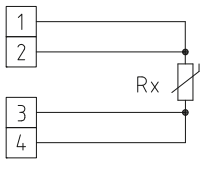
TECHNICAL DATA

Measuring range:	–30...+80 °C
Sensors / output:	see table, passive
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000)
Sensor:	active over the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated,** (**MWTF**) (made from reinforced thermoplastic hose on the **MWTF-SD**), with anti-kink spring and sleeve, stainless steel, V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m, see table (nominal length optionally up to max. 20 m)
Rod laying:	**Observe the admissible values!** Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N** for the **MWTF** **< 100 N** for the **MWTF-SD**
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	by mounting flange, plastic, (galvanised steel optional, see accessories) and mounting clamps **MK-05-M**
Ambient temperature:	–20...+80 °C
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) for the **MWTF-SD** **IP 65** (according to EN 60 529) for the **MWTF** Housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
ACCESSORIES	see table

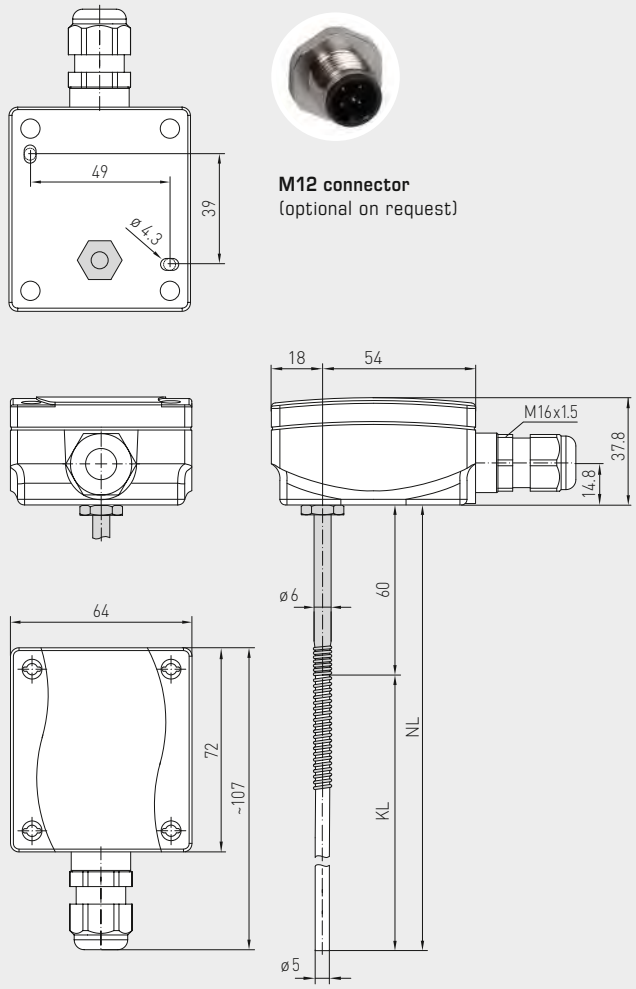
1x two-wire connection
standard



1x four-wire connection
(optional)



Dimensional drawing **MWTF**



M12 connector
(optional on request)

MWTF
Rod length 3 m / 6 m
(IP 65)



MWTF-SD
Rod length 3 m / 6 m
(IP 54)





THERMASGARD® MWTF
THERMASGARD® MWTF-SD

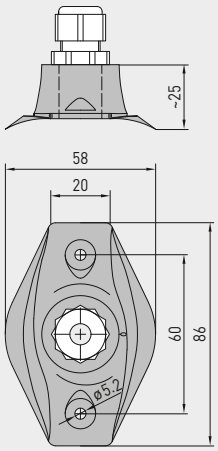
Mean value / rod / duct temperature sensor including mounting flange, with passive output

S+S REGELTECHNIK

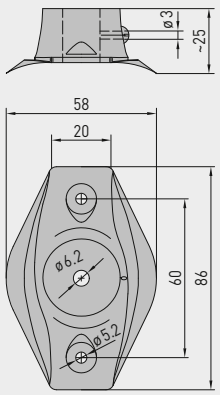


MWTF
Rod length 0,4 m
(IP 65)

Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



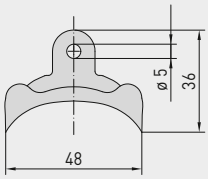
MF-06-K
Mounting flange, plastic
(Included in the scope of delivery)



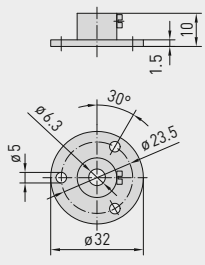
KRD-04
Capillary tube bushing, plastic
(optional)



Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**



MF-06-M
Mounting flange, metal
(optional)



MK-05-M
Mounting clamps, galvanised steel
(from 3 m rod length, included in the scope of delivery)



MWTF
Rod length 3 m / 6 m
(IP 65)



MWTF-SD
Rod length 3 m / 6 m
(IP 54)



THERMASGARD® MWTF-SD	Mean-value temperature sensor with rod made from reinforced **thermoplastic hose**, *Standard*			
Type / WG03B	**Sensor / Output**	**Rod length**	**Item No.**	**Price**
MWTF-SD	**Pt 1000**		**IP 54**	
MWTF-SD Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	**3.0 m**	1101-3050-5231-200	**97,47 €**
MWTF-SD Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	**6.0 m**	1101-3050-5261-200	**108,44 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

THERMASGARD® MWTF	Mean-value temperature sensor with rod made from **copper, plastic-coated**, *Premium*			
Type / WG03	**Sensor / Output**	**Rod length**	**Item No.**	**Price**
MWTF	**Pt 100**		**IP 65**	
MWTF Pt100 0,4m	Pt100 (according to DIN EN 60 751, class B)	**0.4 m**	1101-3050-1083-000	**85,24 €**
MWTF Pt100 3m	Pt100 (according to DIN EN 60 751, class B)	**3.0 m**	1101-3050-1233-000	**149,47 €**
MWTF Pt100 6m	Pt100 (according to DIN EN 60 751, class B)	**6.0 m**	1101-3050-1263-000	**200,63 €**
MWTF	**Pt 1000**		**IP 65**	
MWTF Pt1000 0,4m	Pt1000 (according to DIN EN 60 751, class B)	**0.4 m**	1101-3050-5081-000	**102,15 €**
MWTF Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	**3.0 m**	1101-3050-5231-000	**149,47 €**
MWTF Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	**6.0 m**	1101-3050-5261-000	**224,06 €**
MWTF	**Ni 1000**		**IP 65**	
MWTF Ni1000 0,4m	Ni1000 (according to DIN EN 43 760, class B)	**0.4 m**	1101-3050-9081-000	**97,73 €**
MWTF Ni1000 3m	Ni1000 (according to DIN EN 43 760, class B)	**3.0 m**	1101-3050-9231-000	**156,69 €**
MWTF Ni1000 6m	Ni1000 (according to DIN EN 43 760, class B)	**6.≠0 m**	1101-3050-9261-000	**200,63 €**
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)		on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

ACCESSORIES			
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,30 €**
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100	**12,95 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**9,18 €**
MK-05-M	**Mounting clamps**, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	**10,18 €**
	For further information see last chapter!		

THERMASGARD® ETF 7

Screw-in / immersion temperature sensors
with neck tube (stepped once)
with passive output

S+S REGELTECHNIK

Very quickly responding screw-in resistance thermometer / immersion temperature sensor **THERM**ASGARD® **ETF 7** with passive output, neck tube and a single-tapered stainless steel protective tube, housing cover with quick-locking screws, very short reaction time, particularly suitable for very quick temperature changes and control operations, e.g. in hydraulic systems.

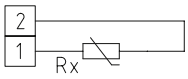
ETF 7



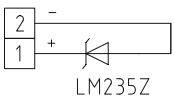
TECHNICAL DATA

Measuring range:	–35...+150 °C
Sensors / output:	see table, passive (**Perfect Sensor Protection**)
Response times:	$t_{0.5}$ = 2.8 s $t_{0.9}$ = 10 s (for water at a flow rate of 2 m/s)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Protective tube:	stainless steel **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 6 bar, Ø = 6 mm, single-tapered to Ø = 4 mm (see dimensional drawing) length of neck tube (HL) = 25 mm inserted length (EL) = 100 - 250 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

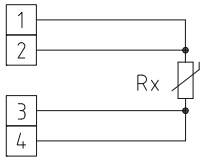
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)

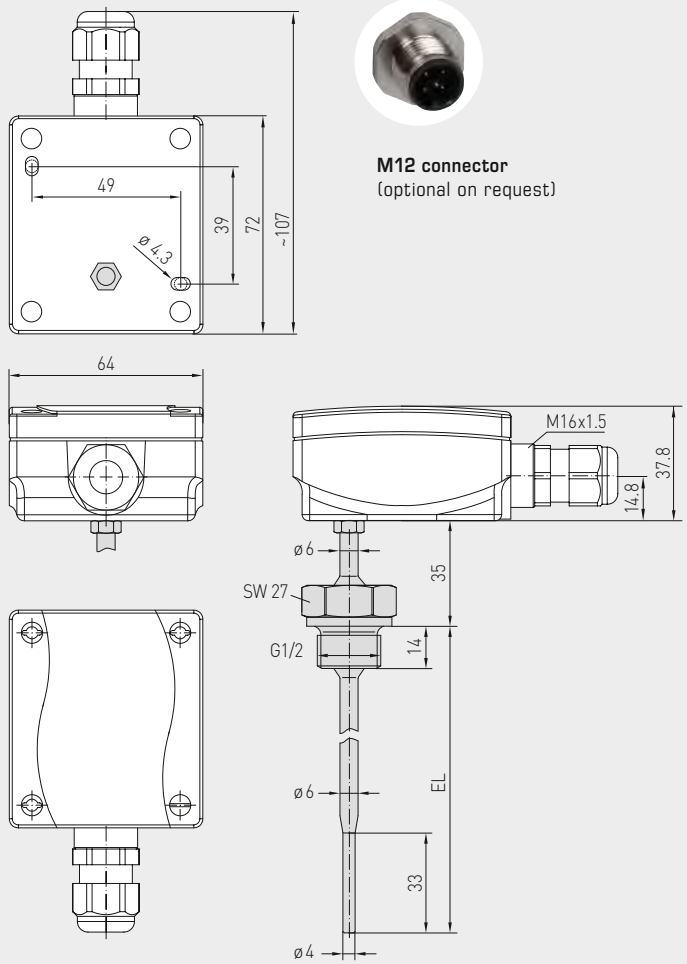


High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION



Dimensional drawing ETF 7



M12 connector
(optional on request)

ETF 7



THERMASGARD® **ETF 7**	Screw-in / immersion temperature sensor with neck tube		
Type / WG01	**Sensor / Output**	**Item No.**	**Price**
ETF7 PT100 xx	**Pt100**		
ETF7 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1023-000	**146,99 €**
ETF7 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1033-000	**148,44 €**
ETF7 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1053-000	**151,83 €**
ETF7 PT1000 xx	**Pt1000**		
ETF7 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5021-000	**148,57 €**
ETF7 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5031-000	**149,54 €**
ETF7 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5051-000	**152,55 €**
ETF7 NI1000 xx	**Ni1000**		
ETF7 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2021-000	**163,85 €**
ETF7 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2031-000	**165,43 €**
ETF7 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2051-000	**167,50 €**
ETF7 NI1000TK xx	**Ni1000 TK5000**		
ETF7 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-2081-0021-000	**154,45 €**
ETF7 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-2081-0031-000	**154,86 €**
ETF7 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-2081-0051-000	**156,29 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101	on request	

S+S REGELTECHNIK

Immersion / screw-in / duct temperature sensor, with passive output

Resistance thermometer / temperature sensor **THERM**ASGARD® **TF 54** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

TF 54
Basic unit



TECHNICAL DATA

Measuring range:	–35...+180 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm², via terminal screws on ceramic bas
Cable connection:	**TF 54** (standard) adjusting screw made of metal (M 20 x 1,5) **TF 54-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **TF 54-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature –20...+100° C
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **TF 54** **IP 65** (according to EN 60 529) **TF 54-KV** / **TF 54-Q**
ACCESSORIES	(see table)
TH-ms / xx	**Immersion sleeve, brass, nickel-plated / galvanised** Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH-VA / xx / 90	**Immersion sleeve, stainless steel, V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, T_{max} = +700 °C

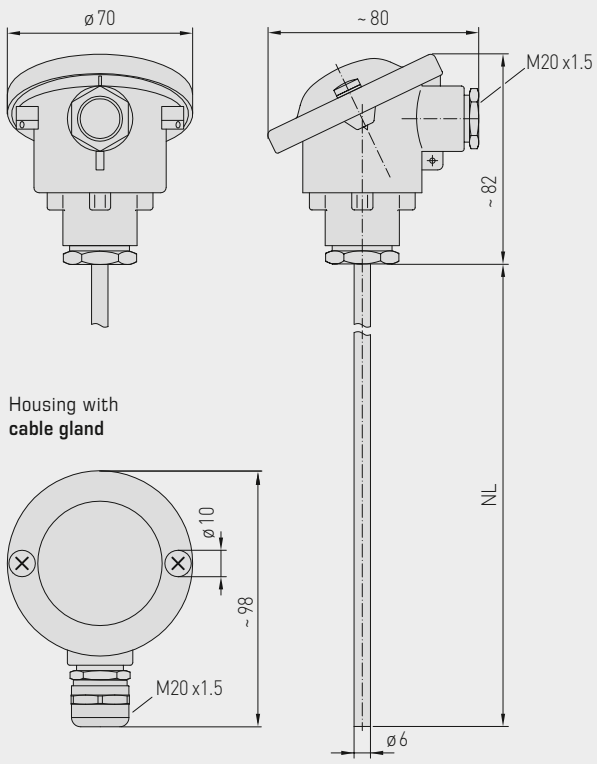
2-wire connection



4-wire connection

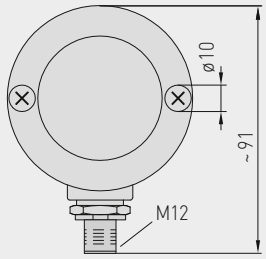


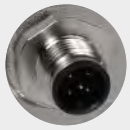
Dimensional drawing **TF 54**



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

TF 54
Standard
(IP 54)



TF 54 - KV
with cable gland
(IP 65)



TF 54 - Q
with M12 connector
(IP 65)

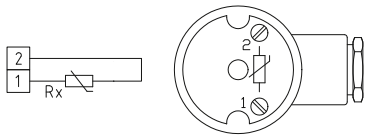




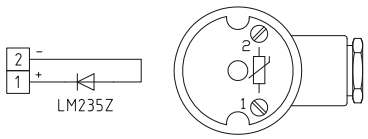
Immersion / screw-in / duct temperature sensor, with passive output

S+S REGELTECHNIK

1x two-wire connection
standard



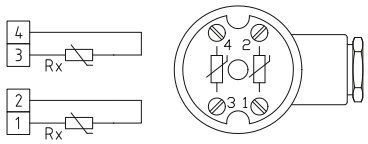
1x two-wire connection
LM235Z (KP10)



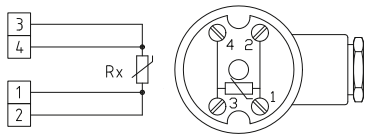
TM54
standard
(IP54)



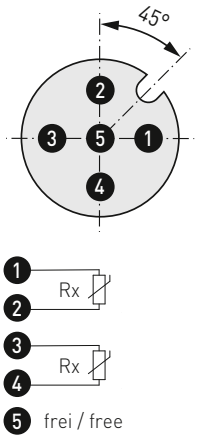
2x two-wire connection
(optional)



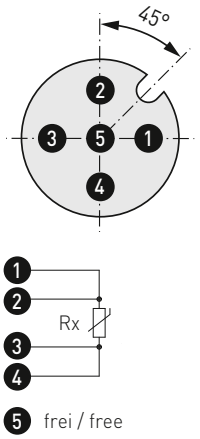
1x four-wire connection
(Pt100 / optional)



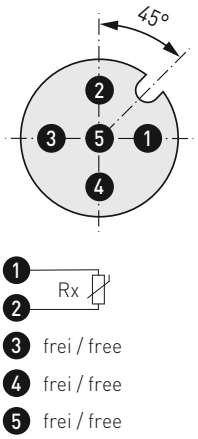
2x two-wire connection
pin assignment (M12)



1x four-wire connection
pin assignment (M12)



1x two-wire connection
pin assignment (M12)



THERMASGARD® TF 54	Temperature sensor (Basic unit)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
TF 54 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP54**, 4-wire	
TF54 Pt100 50mm	Pt100	**50 mm**	1101-7050-1013-000	**68,37 €**
TF54 Pt100 100mm	Pt100	**100 mm**	1101-7050-1023-000	**70,03 €**
TF54 Pt100 150mm	Pt100	**150 mm**	1101-7050-1033-000	**71,53 €**
TF54 Pt100 200mm	Pt100	**200 mm**	1101-7050-1043-000	**74,28 €**
TF54 Pt100 250mm	Pt100	**250 mm**	1101-7050-1053-000	**74,60 €**
TF54 Pt100 300mm	Pt100	**300 mm**	1101-7050-1063-000	**74,87 €**
TF54 Pt100 400mm	Pt100	**400 mm**	1101-7050-1083-000	**75,91 €**
TF 54 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP54**, 2-wire	
TF54 Pt1000 50mm	Pt1000	**50 mm**	1101-7050-5011-000	**68,37 €**
TF54 Pt1000 100mm	Pt1000	**100 mm**	1101-7050-5021-000	**70,03 €**
TF54 Pt1000 150mm	Pt1000	**150 mm**	1101-7050-5031-000	**71,53 €**
TF54 Pt1000 200mm	Pt1000	**200 mm**	1101-7050-5041-000	**74,28 €**
TF54 Pt1000 250mm	Pt1000	**250 mm**	1101-7050-5051-000	**74,66 €**
TF54 Pt1000 300mm	Pt1000	**300 mm**	1101-7050-5061-000	**74,87 €**
TF54 Pt1000 400mm	Pt1000	**400 mm**	1101-7050-5081-000	**75,91 €**

Continued on next page...

THERMASGARD® TF 54	Temperature sensor (Basic unit)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
TF 54 Ni1000 xx	**Ni 1000** (according to DIN EN 43760, class B, TCR = 6180 ppm / K)		**IP 54**, 2-wire	
TF54 Ni1000 50mm	Ni1000	**50 mm**	1101-7050-9011-000	**69,56 €**
TF54 Ni1000 100mm	Ni1000	**100 mm**	1101-7050-9021-000	**71,54 €**
TF54 Ni1000 150mm	Ni1000	**150 mm**	1101-7050-9031-000	**72,70 €**
TF54 Ni1000 200mm	Ni1000	**200 mm**	1101-7050-9041-000	**74,35 €**
TF54 Ni1000 250mm	Ni1000	**250 mm**	1101-7050-9051-000	**74,81 €**
TF54 Ni1000 300mm	Ni1000	**300 mm**	1101-7050-9061-000	**75,08 €**
TF54 Ni1000 400mm	Ni1000	**400 mm**	1101-7050-9081-000	**76,19 €**
TF 54 NI1000TK xx	**Ni1000 TK5000** (TCR = 5000 ppm / K), LG-Ni1000		**IP 54**, 2-wire	
TF54 NiTK 50mm	Ni1000 TK5000	**50 mm**	1101-7051-0011-000	**69,83 €**
TF54 NiTK 100mm	Ni1000 TK5000	**100 mm**	1101-7051-0021-000	**72,39 €**
TF54 NiTK 150mm	Ni1000 TK5000	**150 mm**	1101-7051-0031-000	**73,59 €**
TF54 NiTK 200mm	Ni1000 TK5000	**200 mm**	1101-7051-0041-000	**74,61 €**
TF54 NiTK 250mm	Ni1000 TK5000	**250 mm**	1101-7051-0051-000	**75,08 €**
TF54 NiTK 300mm	Ni1000 TK5000	**300 mm**	1101-7051-0061-000	**75,31 €**
TF54 NiTK 400mm	Ni1000 TK5000	**400 mm**	1101-7051-0081-000	**76,45 €**
TF 54 LM235Z xx	**LM235Z** (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		**IP 54**, 2-wire	
TF54 LM235Z 50mm	LM235Z	**50 mm**	1101-7052-1011-000	**69,78 €**
TF54 LM235Z 100mm	LM235Z	**100 mm**	1101-7052-1021-000	**70,23 €**
TF54 LM235Z 150mm	LM235Z	**150 mm**	1101-7052-1031-000	**70,35 €**
TF54 LM235Z 200mm	LM235Z	**200 mm**	1101-7052-1041-000	**71,14 €**
TF54 LM235Z 250mm	LM235Z	**250 mm**	1101-7052-1051-000	**72,98 €**
TF54 LM235Z 300mm	LM235Z	**300 mm**	1101-7052-1061-000	**73,57 €**
TF54 LM235Z 400mm	LM235Z	**400 mm**	1101-7052-1081-000	**74,81 €**
TF 54 NTC 1,8 K xx	**NTC 1,8 K**		**IP 54**, 2-wire	
TF54 NTC1,8K 50mm	NTC 1,8 K	**50 mm**	1101-7051-2011-000	**69,44 €**
TF54 NTC1,8K 100mm	NTC 1,8 K	**100 mm**	1101-7051-2021-000	**73,57 €**
TF54 NTC1,8K 150mm	NTC 1,8 K	**150 mm**	1101-7051-2031-000	**73,94 €**
TF54 NTC1,8K 200mm	NTC 1,8 K	**200 mm**	1101-7051-2041-000	**74,47 €**
TF54 NTC1,8K 250mm	NTC 1,8 K	**250 mm**	1101-7051-2051-000	**75,73 €**
TF54 NTC1,8K 300mm	NTC 1,8 K	**300 mm**	1101-7051-2061-000	**76,45 €**
TF54 NTC1,8K 400mm	NTC 1,8 K	**400 mm**	1101-7051-2081-000	**76,74 €**
TF 54 NTC10K xx	**NTC 10K**		**IP 54**, 2-wire	
TF54 NTC10K 50mm	NTC 10K	**50 mm**	1101-7051-5011-000	**69,44 €**
TF54 NTC10K 100mm	NTC 10K	**100 mm**	1101-7051-5021-000	**73,57 €**
TF54 NTC10K 150mm	NTC 10K	**150 mm**	1101-7051-5031-000	**73,94 €**
TF54 NTC10K 200mm	NTC 10K	**200 mm**	1101-7051-5041-000	**74,47 €**
TF54 NTC10K 250mm	NTC 10K	**250 mm**	1101-7051-5051-000	**75,73 €**
TF54 NTC10K 300mm	NTC 10K	**300 mm**	1101-7051-5061-000	**76,45 €**
TF54 NTC10K 400mm	NTC 10K	**400 mm**	1101-7051-5081-000	**76,74 €**
TF 54 NTC20K xx	**NTC 20K**		**IP 54**, 2-wire	
TF54 NTC20K 50mm	NTC 20K	**50 mm**	1101-7051-6011-000	**69,44 €**
TF54 NTC20K 100mm	NTC 20K	**100 mm**	1101-7051-6021-000	**73,57 €**
TF54 NTC20K 150mm	NTC 20K	**150 mm**	1101-7051-6031-000	**73,94 €**
TF54 NTC20K 200mm	NTC 20K	**200 mm**	1101-7051-6041-000	**74,47 €**
TF54 NTC20K 250mm	NTC 20K	**250 mm**	1101-7051-6051-000	**75,73 €**
TF54 NTC20K 300mm	NTC 20K	**300 mm**	1101-7051-6061-000	**76,45 €**
TF54 NTC20K 400mm	NTC 20K	**400 mm**	1101-7051-6081-000	**76,74 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Immersion / screw-in / duct temperature sensor, with passive output

S+S REGELTECHNIK

TF 54 - Q
with M12 connector
(IP 65)



THERMASGARD® **TF 54 - Q**	Temperature sensor (Basic unit **with M12 connector**)				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
TF 54 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wire	
TF54 Pt100 50mm **Q**	Pt100	**50 mm**	●	2Z01-4111-0100-011	**111,55 €**
TF54 Pt100 100mm **Q**	Pt100	**100 mm**	●	2Z01-4111-0100-021	**113,20 €**
TF54 Pt100 150mm **Q**	Pt100	**150 mm**	●	2Z01-4111-0100-031	**114,72 €**
TF54 Pt100 200mm **Q**	Pt100	**200 mm**	●	2Z01-4111-0100-041	**117,45 €**
TF54 Pt100 250mm **Q**	Pt100	**250 mm**	●	2Z01-4111-0100-051	**117,79 €**
TF54 Pt100 300mm **Q**	Pt100	**300 mm**	●	2Z01-4111-0100-061	**118,06 €**
TF54 Pt100 400mm **Q**	Pt100	**400 mm**	●	2Z01-4111-0100-081	**119,11 €**
TF 54 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
TF54 Pt1000 50mm **Q**	Pt1000	**50 mm**	●	2Z05-4111-0100-011	**111,55 €**
TF54 Pt1000 100mm **Q**	Pt1000	**100 mm**	●	2Z05-4111-0100-021	**113,20 €**
TF54 Pt1000 150mm **Q**	Pt1000	**150 mm**	●	2Z05-4111-0100-031	**114,72 €**
TF54 Pt1000 200mm **Q**	Pt1000	**200 mm**	●	2Z05-4111-0100-041	**117,45 €**
TF54 Pt1000 250mm **Q**	Pt1000	**250 mm**	●	2Z05-4111-0100-051	**117,79 €**
TF54 Pt1000 300mm **Q**	Pt1000	**300 mm**	●	2Z05-4111-0100-061	**118,06 €**
TF54 Pt1000 400mm **Q**	Pt1000	**400 mm**	●	2Z05-4111-0100-081	**119,11 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	optionally also with two or other sensors			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

TF 54 - KV
with cable gland
(IP 65)



THERMASGARD® **TF 54 - KV**	Temperature sensor (Basic unit **with cable gland**)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
TF 54 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
TF54 Pt100 50mm **KV**	Pt100	**50 mm**	1101-7070-1013-000	**78,08 €**
TF54 Pt100 100mm **KV**	Pt100	**100 mm**	1101-7070-1023-000	**79,73 €**
TF54 Pt100 150mm **KV**	Pt100	**150 mm**	1101-7070-1033-000	**81,24 €**
TF54 Pt100 200mm **KV**	Pt100	**200 mm**	1101-7070-1043-000	**80,63 €**
TF54 Pt100 250mm **KV**	Pt100	**250 mm**	1101-7070-1053-000	**84,33 €**
TF54 Pt100 300mm **KV**	Pt100	**300 mm**	1101-7070-1063-000	**84,57 €**
TF54 Pt100 400mm **KV**	Pt100	**400 mm**	1101-7070-1083-000	**85,64 €**
TF 54 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
TF54 Pt1000 50mm **KV**	Pt1000	**50 mm**	1101-7070-5011-000	**78,09 €**
TF54 Pt1000 100mm **KV**	Pt1000	**100 mm**	1101-7070-5021-000	**79,73 €**
TF54 Pt1000 150mm **KV**	Pt1000	**150 mm**	1101-7070-5031-000	**77,90 €**
TF54 Pt1000 200mm **KV**	Pt1000	**200 mm**	1101-7070-5041-000	**84,00 €**
TF54 Pt1000 250mm **KV**	Pt1000	**250 mm**	1101-7070-5051-000	**84,34 €**
TF54 Pt1000 300mm **KV**	Pt1000	**300 mm**	1101-7070-5061-000	**81,44 €**
TF54 Pt1000 400mm **KV**	Pt1000	**400 mm**	1101-7070-5081-000	**85,64 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	optionally also with two or other sensors		on request	

S+S REGELTECHNIK

Immersion / screw-in / duct temperature sensor, with passive output

One basic device in four variants ...



TF 54 +
TH-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated / galvanised



TF 54 +
TH-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TF 54 +
TH-VA/xx/90

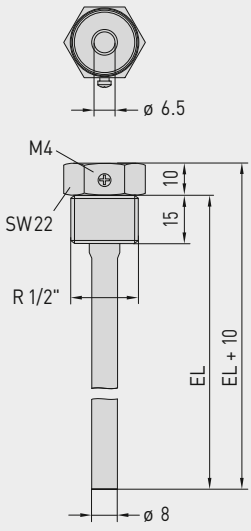
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



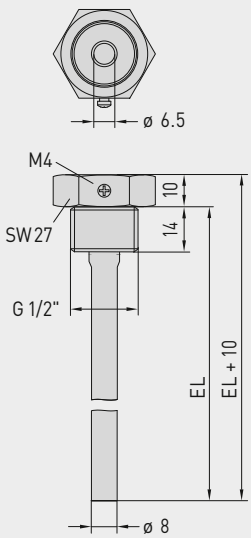
TF 54 +
MF-06-M

Duct temperature sensor with mounting flange, metal

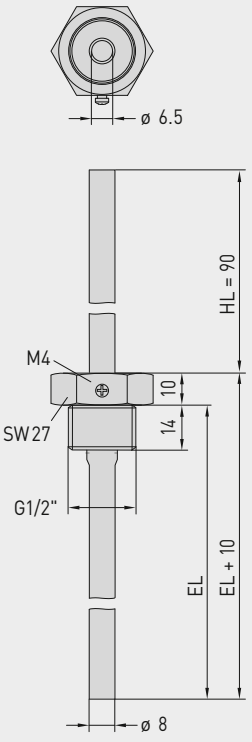
Dimensional drawing
TH-ms/xx



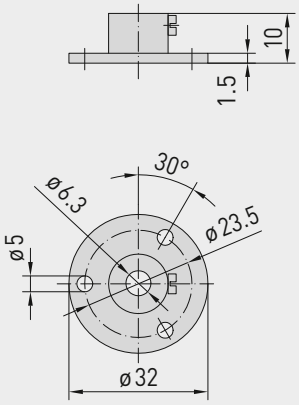
Dimensional drawing
TH-VA/xx



Dimensional drawing
TH-VA/xx/90



Dimensional drawing
MF-06-M



...through combination with accessories:



TH-ms/xx

Immersion sleeve,
brass, nickel-plated / galvanised,
thread-sealing, conical,
according to DIN 10226



TH-VA/xx

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-06-M

Mounting flange,
metal

THERMASGARD® **TH**	Immersion sleeve Ø 8 mm (accessories)				
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated / galvanised**			without neck tube	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,59 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,93 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,54 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,91 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,79 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**14,17 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**14,29 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,42 €**
TH-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,89 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**23,08 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,80 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**26,14 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**32,50 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**33,96 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**34,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**34,79 €**
TH-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,91 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**31,26 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**32,80 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**34,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**35,83 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**38,84 €**
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				

Mounting flange (accessories)				
Type / WG01		**T_{max}**	**Item No.**	**Price**
MF				
MF-06-M	**Mounting flange,** metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-100	**12,95 €**
Note:	For further information see last chapter!			

S+S REGELTECHNIK

Screw-in / immersion temperature sensor with neck tube, with passive output

Screw-in resistance thermometer / temperature sensor with neck tube **THERM**ASGARD® **ETF 6** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, tanks or storage systems, preferably where tubes or tanks must be isolated.

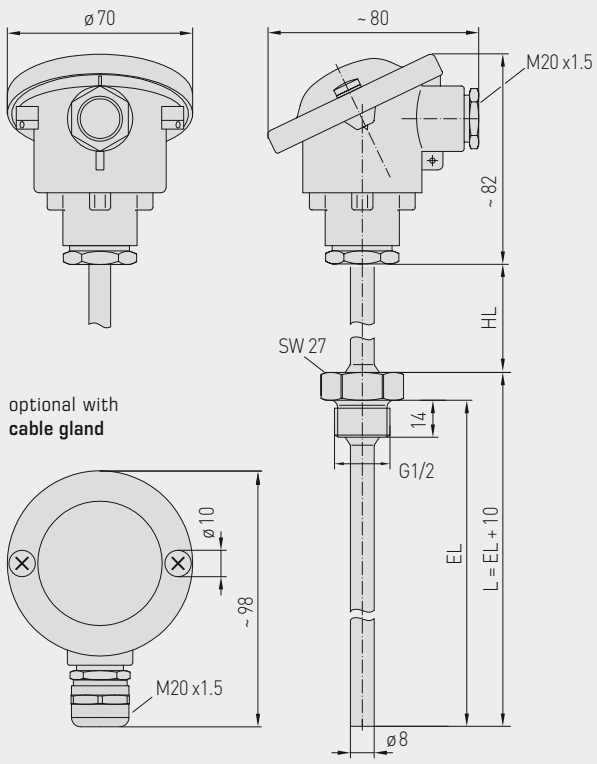
ETF 6
standard



TECHNICAL DATA

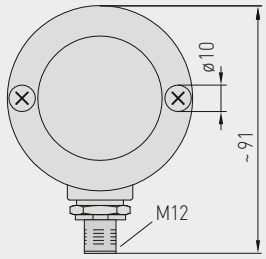
Measuring range:	–35...+180 °C (T_{max} NTC = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm², via terminal screws on ceramic bas
Cable connection:	**ETF 6** (standard) adjusting screw made of metal (M 20 x 1,5) **ETF 6-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **ETF 6-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature –20...+100° C
Protective tube:	stainless steel **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G ½"
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **ETF 6** **IP 65** (according to EN 60 529) **ETF 6-KV** / **ETF 6-Q**

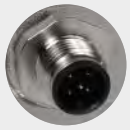
Dimensional drawing **ETF 6**



optional with **cable gland**

optional with **M12 connector**





M12 connector
(optional on request)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

ETF 6
standard
(IP 54)



ETF 6 - KV
with cable gland
(IP 65)



ETF 6 - Q
with M12 connector
(IP 65)

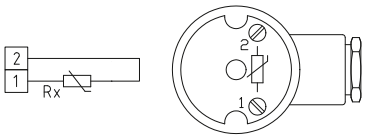




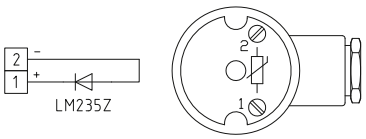
Screw-in / immersion temperature sensor with neck tube, with passive output

S+S REGELTECHNIK

1x two-wire connection
standard



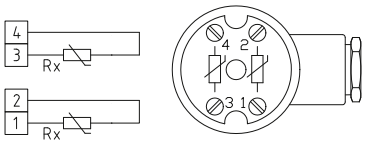
1x two-wire connection
LM235Z (KP10)



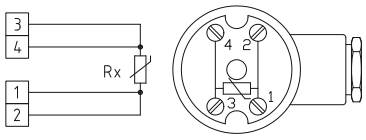
ETF6
standard
(IP54)



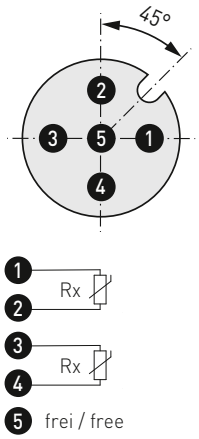
2x two-wire connection
(optional)



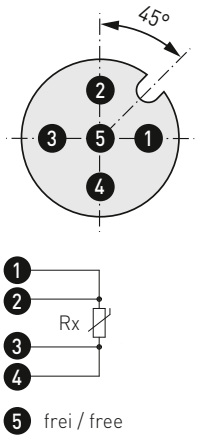
1x four-wire connection
(Pt100 / optional)



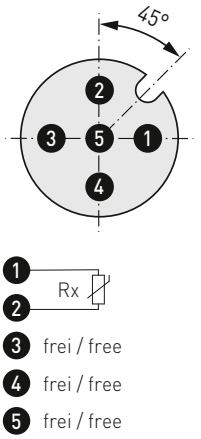
2x two-wire connection
pin assignment (M12)



1x four-wire connection
pin assignment (M12)



1x two-wire connection
pin assignment (M12)



THERMASGARD® ETF 6	Screw-in / immersion temperature sensor with neck tube (standard)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
ETF6 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP54**, 4-wire	
ETF6 Pt100 100/80	Pt100	**100 mm**	1101-2070-1023-000	**87,21 €**
ETF6 Pt100 150/80	Pt100	**150 mm**	1101-2070-1033-000	**91,79 €**
ETF6 Pt100 200/80	Pt100	**200 mm**	1101-2070-1043-000	**94,40 €**
ETF6 Pt100 250/80	Pt100	**250 mm**	1101-2070-1053-000	**96,90 €**
ETF6 Pt100 400/80	Pt100	**400 mm**	1101-2070-1083-000	**99,93 €**
ETF6 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP54**, 2-wire	
ETF6 Pt1000 100/80	Pt1000	**100 mm**	1101-2070-5021-000	**89,30 €**
ETF6 Pt1000 150/80	Pt1000	**150 mm**	1101-2070-5031-000	**94,40 €**
ETF6 Pt1000 200/80	Pt1000	**200 mm**	1101-2070-5041-000	**95,90 €**
ETF6 Pt1000 250/80	Pt1000	**250 mm**	1101-2070-5051-000	**97,05 €**
ETF6 Pt1000 400/80	Pt1000	**400 mm**	1101-2070-5081-000	**100,89 €**

Continued on next page...

THERMASGARD® ETF 6	Screw-in / immersion temperature sensor with neck tube (standard)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
ETF6 Ni1000 xx	**Ni 1000** (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)		**IP 54**, 2-wire	
ETF6 Ni1000 100/80	Ni1000	**100 mm**	1101-2070-9021-000	**92,69 €**
ETF6 Ni1000 150/80	Ni1000	**150 mm**	1101-2070-9031-000	**94,33 €**
ETF6 Ni1000 200/80	Ni1000	**200 mm**	1101-2070-9041-000	**96,88 €**
ETF6 Ni1000 250/80	Ni1000	**250 mm**	1101-2070-9051-000	**97,38 €**
ETF6 Ni1000 400/80	Ni1000	**400 mm**	1101-2070-9081-000	**102,29 €**
ETF6 NI1000TK xx	**Ni1000 TK5000** (TCR = 5000 ppm / K), LG - Ni1000		**IP 54**, 2-wire	
ETF6 NiTK 100/80	Ni1000 TK5000	**100 mm**	1101-2071-0021-000	**93,10 €**
ETF6 NiTK 150/80	Ni1000 TK5000	**150 mm**	1101-2071-0031-000	**95,30 €**
ETF6 NiTK 200/80	Ni1000 TK5000	**200 mm**	1101-2071-0041-000	**97,77 €**
ETF6 NiTK 250/80	Ni1000 TK5000	**250 mm**	1101-2071-0051-000	**100,76 €**
ETF6 NiTK 400/80	Ni1000 TK5000	**400 mm**	1101-2071-0081-000	**103,33 €**
ETF6 LM235Z xx	**LM235Z** (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		**IP 54**, 2-wire	
ETF6 LM235Z 100/80	LM235Z	**100 mm**	1101-2072-1021-000	**88,52 €**
ETF6 LM235Z 150/80	LM235Z	**150 mm**	1101-2072-1031-000	**92,43 €**
ETF6 LM235Z 200/80	LM235Z	**200 mm**	1101-2072-1041-000	**94,40 €**
ETF6 LM235Z 250/80	LM235Z	**250 mm**	1101-2072-1051-000	**95,73 €**
ETF6 LM235Z 400/80	LM235Z	**400 mm**	1101-2072-1081-000	**101,75 €**
ETF6 NTC 1,8 K xx	**NTC 1,8 K**		**IP 54**, 2-wire	
ETF6 NTC1,8K 100/80	NTC 1,8 K	**100 mm**	1101-2071-2021-000	**92,83 €**
ETF6 NTC1,8K 150/80	NTC 1,8 K	**150 mm**	1101-2071-2031-000	**94,22 €**
ETF6 NTC1,8K 200/80	NTC 1,8 K	**200 mm**	1101-2071-2041-000	**95,66 €**
ETF6 NTC1,8K 250/80	NTC 1,8 K	**250 mm**	1101-2071-2051-000	**99,78 €**
ETF6 NTC1,8K 400/80	NTC 1,8 K	**400 mm**	1101-2071-2081-000	**102,60 €**
ETF6 NTC10K xx	**NTC 10K**		**IP 54**, 2-wire	
ETF6 NTC10K 100/80	NTC 10K	**100 mm**	1101-2071-5021-000	**92,83 €**
ETF6 NTC10K 150/80	NTC 10K	**150 mm**	1101-2071-5031-000	**94,22 €**
ETF6 NTC10K 200/80	NTC 10K	**200 mm**	1101-2071-5041-000	**95,66 €**
ETF6 NTC10K 250/80	NTC 10K	**250 mm**	1101-2071-5051-000	**99,78 €**
ETF6 NTC10K 400/80	NTC 10K	**400 mm**	1101-2071-5081-000	**102,60 €**
ETF6 NTC20K xx	**NTC 20K**		**IP 54**, 2-wire	
ETF6 NTC20K 100/80	NTC 20K	**100 mm**	1101-2071-6021-000	**92,83 €**
ETF6 NTC20K 150/80	NTC 20K	**150 mm**	1101-2071-6031-000	**94,22 €**
ETF6 NTC20K 200/80	NTC 20K	**200 mm**	1101-2071-6041-000	**95,66 €**
ETF6 NTC20K 250/80	NTC 20K	**250 mm**	1101-2071-6051-000	**99,78 €**
ETF6 NTC20K 400/80	NTC 20K	**400 mm**	1101-2071-6081-000	**102,60 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Screw-in / immersion temperature sensor with neck tube, with passive output

S+S REGELTECHNIK

ETF 6 - Q
with M12 connector
(IP 65)



THERMASGARD® ETF 6 - Q	Screw-in / immersion temperature sensor with neck tube (with M12 connector)				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
ETF6 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wire	
ETF6 Pt100 100/80mm **Q**	Pt100	**100 mm**	●	2Z01-4121-0100-041	**130,40 €**
ETF6 Pt100 150/80mm **Q**	Pt100	**150 mm**	●	2Z01-4121-0100-051	**134,97 €**
ETF6 Pt100 200/80mm **Q**	Pt100	**200 mm**	●	2Z01-4121-0100-061	**137,59 €**
ETF6 Pt100 250/80mm **Q**	Pt100	**250 mm**	●	2Z01-4121-0100-071	**140,08 €**
ETF6 Pt100 400/80mm **Q**	Pt100	**400 mm**	●	2Z01-4121-0100-101	**143,21 €**
ETF6 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
ETF6 Pt1000 100/80mm **Q**	Pt1000	**100 mm**	●	2Z05-4121-0100-041	**130,40 €**
ETF6 Pt1000 150/80mm **Q**	Pt1000	**150 mm**	●	2Z05-4121-0100-051	**134,97 €**
ETF6 Pt1000 200/80mm **Q**	Pt1000	**200 mm**	●	2Z05-4121-0100-061	**137,59 €**
ETF6 Pt1000 250/80mm **Q**	Pt1000	**250 mm**	●	2Z05-4121-0100-071	**140,08 €**
ETF6 Pt1000 400/80mm **Q**	Pt1000	**400 mm**	●	2Z05-4121-0100-101	**143,11 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	optionally also with two or other sensors			on request	

ACCESSORIES	
	Special accessories for M12 connector see chapter Accessories !

ETF 6 - KV
with cable gland (IP 65)



THERMASGARD® ETF 6 - KV	Screw-in / immersion temperature sensor with neck tube (with cable gland)			
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
ETF6 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP65**, 4-wire	
ETF6 Pt100 100/80mm **KV**	Pt100	**100 mm**	1101-20C0-1023-000	**96,93 €**
ETF6 Pt100 150/80mm **KV**	Pt100	**150 mm**	1101-20C0-1033-000	**101,51 €**
ETF6 Pt100 200/80mm **KV**	Pt100	**200 mm**	1101-20C0-1043-000	**104,12 €**
ETF6 Pt100 250/80mm **KV**	Pt100	**250 mm**	1101-20C0-1053-000	**106,62 €**
ETF6 Pt100 400/80mm **KV**	Pt100	**400 mm**	1101-20C0-1083-000	**109,64 €**
ETF6 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP65**, 2-wire	
ETF6 Pt1000 100/80mm **KV**	Pt1000	**100 mm**	1101-20C0-5021-000	**99,01 €**
ETF6 Pt1000 150/80mm **KV**	Pt1000	**150 mm**	1101-20C0-5031-000	**104,12 €**
ETF6 Pt1000 200/80mm **KV**	Pt1000	**200 mm**	1101-20C0-5041-000	**105,62 €**
ETF6 Pt1000 250/80mm **KV**	Pt1000	**250 mm**	1101-20C0-5051-000	**106,76 €**
ETF6 Pt1000 400/80mm **KV**	Pt1000	**400 mm**	1101-20C0-5081-000	**110,61 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	optionally also with two or other sensors		on request	

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

S+S REGELTECHNIK

Resistance thermometer / smoke gas temperature sensor **THERM**ASGARD® **RGTF 1** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube, incl. mounting flange.

The duct sensor is used to detect relatively high temperatures in gaseous media, eg, for exhaust air and smoke gas temperature measurement.

TECHNICAL DATA

Measuring range:	–35...+600 °C (extended range limits from –100...+750 °C optional)
Sensor / output:	Pt100 / Pt1000 (according to DIN EN 60 751, class B) (**Perfect Sensor Protection**)
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100; optional Pt1000)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm² via terminal screws on ceramic base
Cable connection:	**RGTF 1** (standard) adjusting screw made of metal (M 20 x 1.5); **RGTF 1-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTF 1-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel **V4A** (1.4571), Ø = 8 mm inserted length (EL) = 200 - 500 mm (see table)
Process connection:	by mounting flange, stainless steel **V2A** (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTF 1** **IP 65** (according to EN 60 529) **RGTF1-KV** / **RGTF1-Q**

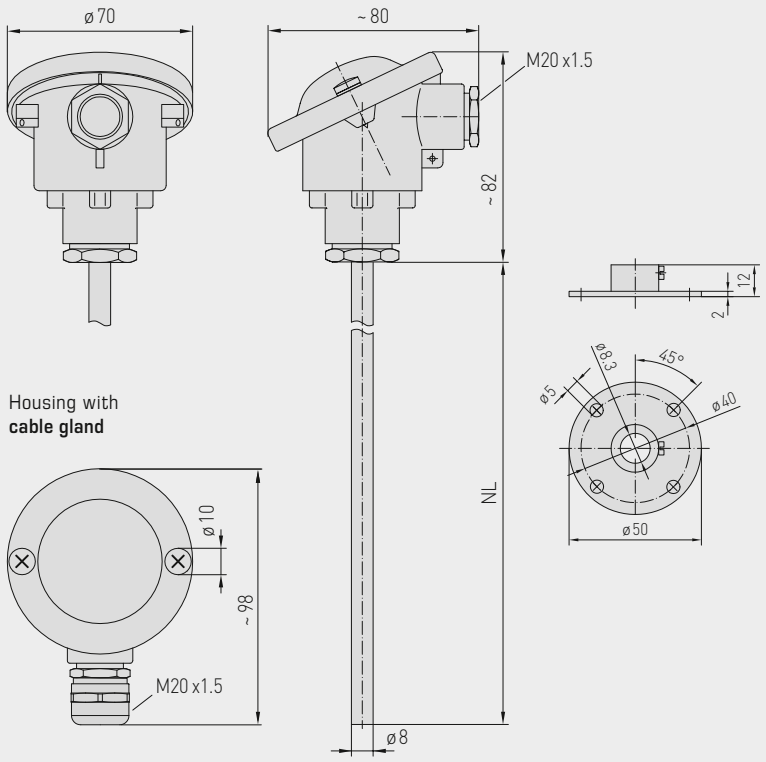
RGTF 1
standard



RGTF 1
Measuring insert with ceramic tubelet

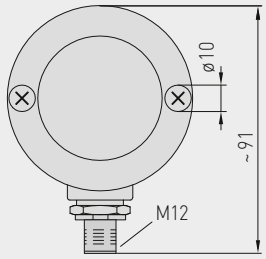
Dimensional drawing

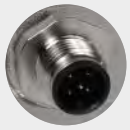
RGTF 1



Housing with
cable gland

Housing with
M12 connector





M12 connector
(male)

RGTF 1
standard
(IP 54)



RGTF 1 - KV
with cable gland
(IP 65)



RGTF 1 - Q
with M12 connector
(IP 65)





High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

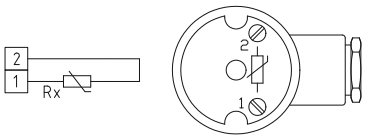
2-wire connection
(Pt1000)



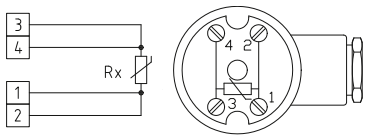
4-wire connection
(Pt100 / Pt1000 optional)



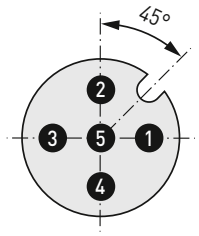
1x two-wire connection
(Pt1000)

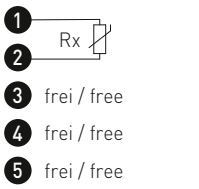


1x four-wire connection
(Pt100 / Pt1000) optional)

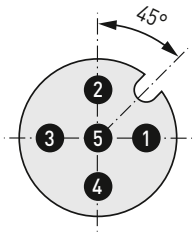


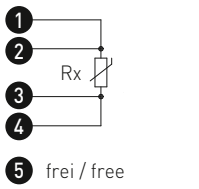
1x two-wire connection
pin assignment (M12)





1x four-wire connection
pin assignment (M12)





RGTF 1
standard
(IP 54)



THERMASGARD® **RGTF 1**	Duct temperature sensors / smoke gas temperature sensors, including mounting flange (Standard)			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF1 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP 54**, 4-wire	
RGTF1 Pt100 200mm	Pt100	**200 mm**	1101-3040-1043-000	**189,99 €**
RGTF1 Pt100 250mm	Pt100	**250 mm**	1101-3040-1053-000	**191,98 €**
RGTF1 Pt100 300mm	Pt100	**300 mm**	1101-3040-1063-000	**196,30 €**
RGTF1 Pt100 500mm	Pt100	**500 mm**	1101-3040-1103-000	**211,52 €**
RGTF1 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP 54**, 2-wire	
RGTF1 Pt1000 200mm	Pt1000	**200 mm**	1101-3040-5041-000	**183,57 €**
RGTF1 Pt1000 250mm	Pt1000	**250 mm**	1101-3040-5051-000	**185,54 €**
RGTF1 Pt1000 300mm	Pt1000	**300 mm**	1101-3040-5061-000	**189,86 €**
RGTF1 Pt1000 500mm	Pt1000	**500 mm**	1101-3040-5101-000	**195,49 €**
Housing variant:	equipped as standard with pressure screw **(IP 54),** optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional		on request	

Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

S+S REGELTECHNIK

RGTF 1 - Q
with M12 connector
(IP 65)



THERMASGARD® RGTF 1 - Q	Duct temperature sensors / smoke gas temperature sensors, including mounting flange (with M12 connector)				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
RGTF1 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wirer	
RGTF1 Pt100 200mm **Q**	Pt100	**200 mm**	●	2Z01-4131-0100-011	**226,64 €**
RGTF1 Pt100 250mm **Q**	Pt100	**250 mm**	●	2Z01-4131-0100-021	**228,72 €**
RGTF1 Pt100 300mm **Q**	Pt100	**300 mm**	●	2Z01-4131-0100-031	**233,03 €**
RGTF1 Pt100 500mm **Q**	Pt100	**500 mm**	●	2Z01-4131-0100-041	**238,69 €**
RGTF1 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
RGTF1 Pt1000 200mm **Q**	Pt1000	**200 mm**	●	2Z05-4131-0100-011	**226,64 €**
RGTF1 Pt1000 250mm **Q**	Pt1000	**250 mm**	●	2Z05-4131-0100-021	**228,72 €**
RGTF1 Pt1000 300mm **Q**	Pt1000	**300 mm**	●	2Z05-4131-0100-031	**233,03 €**
RGTF1 Pt1000 500mm **Q**	Pt1000	**500 mm**	●	2Z05-4131-0100-041	**238,69 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

RGTF 1 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTF 1 - KV**	Duct temperature sensors / smoke gas temperature sensors, including mounting flange **(with cable gland)**			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF1 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
RGTF1 Pt100 200mm **KV**	Pt100	**200 mm**	1101-30D0-1043-000	**193,29 €**
RGTF1 Pt100 250mm **KV**	Pt100	**250 mm**	1101-30D0-1053-000	**195,27 €**
RGTF1 Pt100 300mm **KV**	Pt100	**300 mm**	1101-30D0-1063-000	**199,58 €**
RGTF1 Pt100 500mm **KV**	Pt100	**500 mm**	1101-30D0-1103-000	**205,23 €**
RGTF1 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
RGTF1 Pt1000 200mm **KV**	Pt1000	**200 mm**	1101-30D0-5041-000	**193,29 €**
RGTF1 Pt1000 250mm **KV**	Pt1000	**250 mm**	1101-30D0-5051-000	**195,27 €**
RGTF1 Pt1000 300mm **KV**	Pt1000	**300 mm**	1101-30D0-5061-000	**199,58 €**
RGTF1 Pt1000 500mm **KV**	Pt1000	**500 mm**	1101-30D0-5101-000	**205,23 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional		on request	

S+S REGELTECHNIK

Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

Screw-in resistance thermometer / smoke gas temperature sensor with neck tube **THERM**ASGARD® **RGTF 2** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

The duct sensor is used to detect relatively high temperatures in liquid or gaseous media, eg, for exhaust air and smoke gas temperature measurement..

TECHNICAL DATA

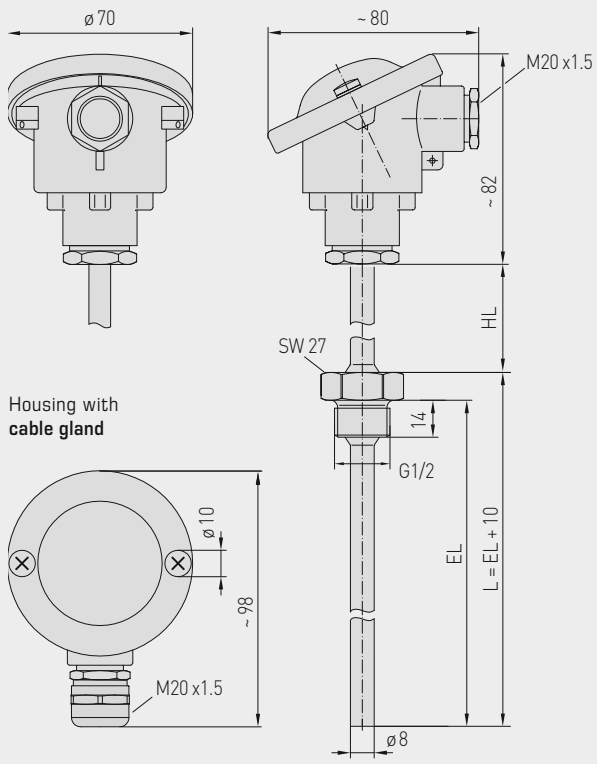
Measuring range:	–35...+600 °C (extended range limits from –100...+750 °C optional)
Sensor / output:	Pt100 / Pt1000 (according to DIN EN 60 751, class B) (**Perfect Sensor Protection**)
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100; optional Pt1000)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm² via terminal screws on ceramic base
Cable connection:	**RGTF 2** (Standard) adjusting screw made of metal (M 20 x 1.5); **RGTF 2-KV** (optional) **cable gland,** brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTF 2-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 500 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTF 2** **IP 65** (according to EN 60 529) **RGTF 2-KV** / **RGTF 2-Q**

RGTF 2
standard



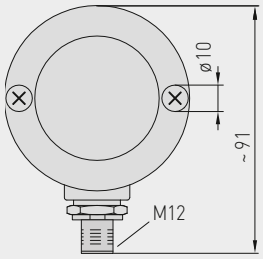
RGTF 2
Measuring insert with ceramic tubelet

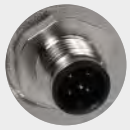
Dimensional drawing **RGTF 2**



Housing with
cable gland

Housing with
M12 connector





M12 connector
(male)

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

RGTF 2
standard
(IP 54)



RGTF 2 - KV
with cable gland
(IP 65)



RGTF 2 - Q
with M12 connector
(IP 65)





Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

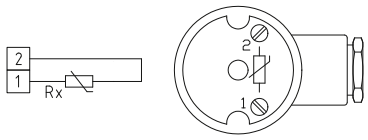
2-wire connection
(Pt1000)



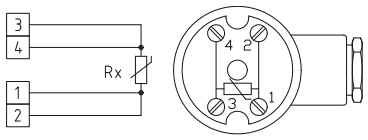
4-wire connection
(Pt100 / Pt1000 optional)



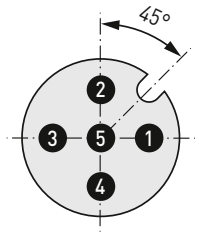
1x two-wire connection
(Pt1000)



1x four-wire connection
(Pt100 / Pt1000) optional)

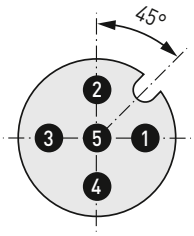


1x two-wire connection
pin assignment (M12)



1 2 Rx
3 frei / free
4 frei / free
5 frei / free

1x four-wire connection
pin assignment (M12)



1 2 3 4 Rx
5 frei / free

RGTF 2
standard
(IP 54)



THERMASGARD® RGTF 2	Screw-in temperature sensors / smoke gas temperature sensors with neck tube (standard)			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF2 Pt100 xx	**Pt100** (according to DIN EN 60751, class B)		**IP 54**, 4-wire	
RGTF2 Pt100 100/80mm	Pt100	**100 mm**	1101-2090-1023-000	**210,99 €**
RGTF2 Pt100 150/80mm	Pt100	**150 mm**	1101-2090-1033-000	**212,16 €**
RGTF2 Pt100 200/80mm	Pt100	**200 mm**	1101-2090-1043-000	**218,71 €**
RGTF2 Pt100 250/80mm	Pt100	**250 mm**	1101-2090-1053-000	**213,73 €**
RGTF2 Pt100 300/80mm	Pt100	**300 mm**	1101-2090-1063-000	**229,21 €**
RGTF2 Pt100 500/80mm	Pt100	**500 mm**	1101-2090-1103-000	**243,64 €**
RGTF2 Pt1000 xx	**Pt1000** (according to DIN EN 60751, class B)		**IP 54**, 2-wire	
RGTF2 Pt1000 100/80	Pt1000	**100 mm**	1101-2090-5021-000	**204,55 €**
RGTF2 Pt1000 150/80	Pt1000	**150 mm**	1101-2090-5031-000	**205,87 €**
RGTF2 Pt1000 200/80	Pt1000	**200 mm**	1101-2090-5041-000	**212,43 €**
RGTF2 Pt1000 250/80	Pt1000	**250 mm**	1101-2090-5051-000	**213,74 €**
RGTF2 Pt1000 300/80	Pt1000	**300 mm**	1101-2090-5061-000	**222,90 €**
RGTF2 Pt1000 500/80	Pt1000	**500 mm**	1101-2090-5101-000	**237,33 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional		on request	

Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

S+S REGELTECHNIK

RGTF 2 - Q
with M12 connector
(IP 65)



THERMASGARD® RGTF 2 - Q	Screw-in temperature sensors / smoke gas temperature sensors with neck tube (with M12 connector)				
Type / WG03	**Sensor / Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
RGTF2 Pt100 xx Q	**Pt100** (according to DIN EN 60751, class B)			**IP 65**, 4-wirer	
RGTF2 Pt100 100/80mm **Q**	Pt100	**100 mm**	●	2Z01-4141-0100-011	**247,73 €**
RGTF2 Pt100 150/80mm **Q**	Pt100	**150 mm**	●	2Z01-4141-0100-021	**249,04 €**
RGTF2 Pt100 200/80mm **Q**	Pt100	**200 mm**	●	2Z01-4141-0100-031	**255,60 €**
RGTF2 Pt100 250/80mm **Q**	Pt100	**250 mm**	●	2Z01-4141-0100-041	**256,91 €**
RGTF2 Pt100 300/80mm **Q**	Pt100	**300 mm**	●	2Z01-4141-0100-051	**266,08 €**
RGTF2 Pt100 500/80mm **Q**	Pt100	**500 mm**	●	2Z01-4141-0100-061	**280,51 €**
RGTF2 Pt1000 xx Q	**Pt1000** (according to DIN EN 60751, class B)			**IP 65**, 2-wire	
RGTF2 Pt1000 100/80mm **Q**	Pt1000	**100 mm**	●	2Z05-4141-0100-011	**247,73 €**
RGTF2 Pt1000 150/80mm **Q**	Pt1000	**150 mm**	●	2Z05-4141-0100-021	**249,04 €**
RGTF2 Pt1000 200/80mm **Q**	Pt1000	**200 mm**	●	2Z05-4141-0100-031	**255,60 €**
RGTF2 Pt1000 250/80mm **Q**	Pt1000	**250 mm**	●	2Z05-4141-0100-041	**256,91 €**
RGTF2 Pt1000 300/80mm **Q**	Pt1000	**300 mm**	●	2Z05-4141-0100-051	**266,08 €**
RGTF2 Pt1000 500/80mm **Q**	Pt1000	**500 mm**	●	2Z05-4141-0100-061	**280,51 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional			on request	

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

RGTF 2 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTF 2 - KV**	Screw-in temperature sensors / smoke gas temperature sensors with neck tube (**with cable gland**)			
Type / WG01	**Sensor / Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTF2 Pt100 xx KV	**Pt100** (according to DIN EN 60751, class B)		**IP 65**, 4-wire	
RGTF2 Pt100 100/80mm **KV**	Pt100	**100 mm**	1101-20D0-1023-000	**214,28 €**
RGTF2 Pt100 150/80mm **KV**	Pt100	**150 mm**	1101-20D0-1033-000	**215,59 €**
RGTF2 Pt100 200/80mm **KV**	Pt100	**200 mm**	1101-20D0-1043-000	**222,15 €**
RGTF2 Pt100 250/80mm **KV**	Pt100	**250 mm**	1101-20D0-1053-000	**223,44 €**
RGTF2 Pt100 300/80mm **KV**	Pt100	**300 mm**	1101-20D0-1063-000	**232,62 €**
RGTF2 Pt100 500/80mm **KV**	Pt100	**500 mm**	1101-20D0-1103-000	**247,06 €**
RGTF2 Pt1000 xx KV	**Pt1000** (according to DIN EN 60751, class B)		**IP 65**, 2-wire	
RGTF2 Pt1000 100/80mm **KV**	Pt1000	**100 mm**	1101-20D0-5021-000	**214,28 €**
RGTF2 Pt1000 150/80mm **KV**	Pt1000	**150 mm**	1101-20D0-5031-000	**215,59 €**
RGTF2 Pt1000 200/80mm **KV**	Pt1000	**200 mm**	1101-20D0-5041-000	**222,15 €**
RGTF2 Pt1000 250/80mm **KV**	Pt1000	**250 mm**	1101-20D0-5051-000	**223,44 €**
RGTF2 Pt1000 300/80mm **KV**	Pt1000	**300 mm**	1101-20D0-5061-000	**232,62 €**
RGTF2 Pt1000 500/80mm **KV**	Pt1000	**500 mm**	1101-20D0-5101-000	**247,06 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional		on request	

THERMASGARD® HTF 50
THERMASGARD® HTF 200

Sleeve sensor / cable temperature sensor duct / immersion / screw-in temperature sensor, with passive output

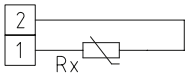
S+S REGELTECHNIK

The sleeve sensor / cable sensor **THERM**ASGARD® **HTF** is used to measure temperatures in liquid and gaseous media. It can be used as a duct sensor and - if installed in an immersion sleeve - as an immersion and screw-in sensor. The sleeve length varies, depending on request, from 30...400 mm (standard is 50 mm respectively 200 mm), the cable length is arbitrary (standard is 1.5 m). Depending on application, with silicone, glass fibre, or PVC leads, for two-wire or four-wire connection. For direct, continuous use in liquids, please use our **THE** immersion sleeves (see type table).

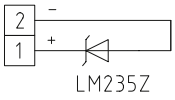
TECHNICAL DATA

Measuring ranges:	–35...+105 °C **PVC**, LiYY, 2 x 0.25 mm² –50...+180 °C **Silicone**, SiHF, 2 x 0.25 mm² –50...+250 °C **PTFE**, 2 x 1.0 mm² –50...+350 °C **glass fibre**, 2 x 0.25 mm² ends stripped with wire end sleeves (extended measuring range limits optional, depending on connection leads, T_{max} Ni1000 = **+180 °C**, T_{max} NTC / Ni1000 TK5000 = **+150 °C**, T_{max} LM235Z = **+125 °C**)
Sensors / output:	see table, passive (optional also with 2 sensors) (**Perfect Sensor Protection** with IP68)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Protective tube	sensor sleeve made of stainless steel, **V4A** (1.4571), Ø = 6 mm **HTF 50** nominal length (NL) = 50 mm **HTF 200** nominal length (NL) = 200 mm (other optional dimensions also available, nominal length (NL) = 30...400 mm)
Connection cable:	cable length (KL) = 1.5 m (optional also 3 m, 5 m, 8 m, 10 m)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	using immersion sleeves **THE** (see table) or mounting flange, plastic (see table) (optionally in galvanised steel, see chapter Accessories)
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
ACCESSORIES	
MF-06-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø = 6.2 mm tube gland, T_{max} = +100 °C (is **not** included in scope of delivery)
THE-ms / xx	**Immersion sleeve, brass, nickel-plated / galvanised,** Ø = 9 mm, inserted length (EL) = 50 - 250 mm (see table), inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5 T_{max} = +130 °C, p_{max} = 16 bar
THE-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 9 mm, inserted length (EL) = 50 - 400 mm (see table), inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5 T_{max} = +200 °C, p_{max} = 40 bar

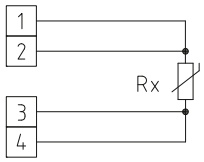
1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



1x four-wire connection
(optional)





IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection



IP 54 (optional)
with **glass fibre** cable

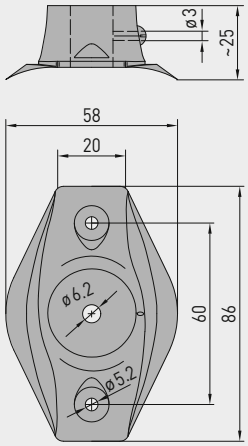
MF-06-K
Mounting flange,
plastic
(optional)



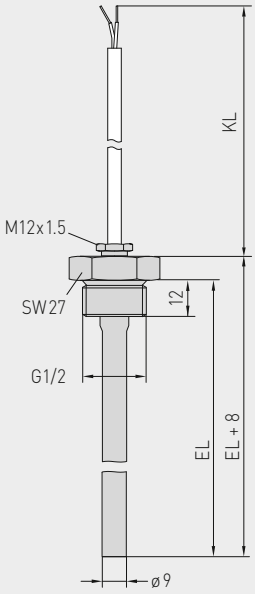
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

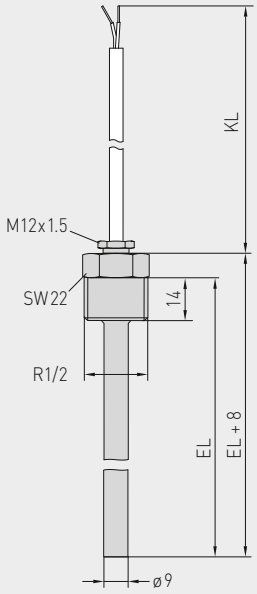
Dimensional drawing **MF-06-K**



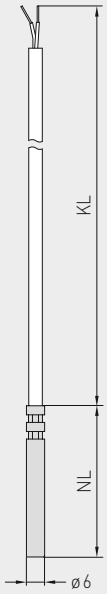
HTF 50 + THE-VA



HTF 50 + THE-ms



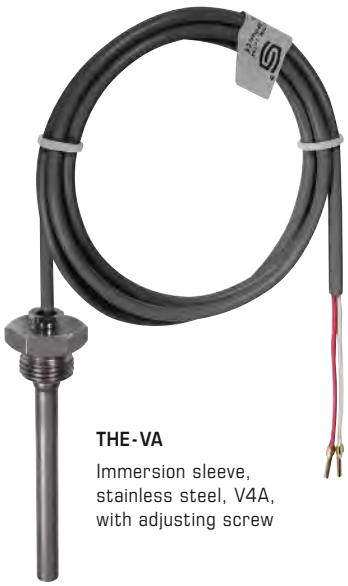
HTF 50 / HTF 200



HTF 200 + MF-06-K
with accessory mounting flange
(see type table)
as duct temperature sensor



HTF 50 + THE-xx
with accessory immersion sleeve
(see type table)
as immersion / screw-in temperature sensor



THE-VA
Immersion sleeve,
stainless steel, V4A,
with adjusting screw



THE-ms
Immersion sleeve,
brass, nickel-plated /
galvanised,
with adjusting screw

HTF 50
with PVC / silicone cable
(standard)



HTF 50
with glass fibre cable



Sleeve sensor / cable temperature sensor
duct / immersion / screw-in temperature sensor,
with passive output

S+S REGELTECHNIK

THERMASGARD® HTF 50	sleeve sensor / cable temperature sensor (NL = 50 mm)					
Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
HTF50 PT100					**Pt 100, class B**	
HTF50 Pt100 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-1211-110	**14,10 €**
HTF50 Pt100 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-1211-120	**17,72 €**
HTF50 Pt100 PTFE 1,5M	**PTFE**	**1.5 m**	–50...+250 °C	IP65 *	1101-6030-1211-140	**59,46 €**
HTF50 Pt100	**Glass Fibre**	**1.5 m**	–50...+350 °C	**IP54**	1101-6030-1211-050	**49,38 €**
HTF50 Pt100 PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6030-1231-110	**17,07 €**
HTF50 Pt100 Silikon 3M	**Silicone**	**3 m**	–50...+180 °C	IP65 *	1101-6030-1231-120	**22,09 €**
HTF50 Pt100 PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6030-1251-110	**21,00 €**
HTF50 Pt100 Silikon 5M	**Silicone**	**5 m**	–50...+180 °C	IP65 *	1101-6030-1251-120	**27,94 €**
HTF50 Pt100 PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6030-1281-110	**26,93 €**
HTF50 Pt100 Silikon 8M	**Silicone**	**8 m**	–50...+180 °C	IP65 *	1101-6030-1281-120	**36,74 €**
HTF50 Pt100 PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6030-1301-110	**30,87 €**
HTF50 Pt100 Silikon 10M	**Silicone**	**10 m**	–50...+180 °C	IP65 *	1101-6030-1301-120	**42,61 €**
HTF50 PT1000					**Pt 1000, class B**	
HTF50 Pt1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-5211-110	**16,60 €**
HTF50 Pt1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-5211-120	**20,39 €**
HTF50 Pt1000 PTFE 1,5M	**PTFE**	**1.5 m**	–50...+250 °C	IP65 *	1101-6030-5211-140	**59,61 €**
HTF50 Pt1000	**Glass Fibre**	**1.5 m**	–50...+350 °C	**IP54**	1101-6030-5211-050	**49,38 €**
HTF50 Pt1000 PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6030-5231-110	**19,56 €**
HTF50 Pt1000 Silikon 3M	**Silicone**	**3 m**	–50...+180 °C	IP65 *	1101-6030-5231-120	**24,80 €**
HTF50 Pt1000 PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6030-5251-110	**23,50 €**
HTF50 Pt1000 Silikon 5M	**Silicone**	**5 m**	–50...+180 °C	IP65 *	1101-6030-5251-120	**30,65 €**
HTF50 Pt1000 PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6030-5281-110	**29,43 €**
HTF50 Pt1000 Silikon 8M	**Silicone**	**8 m**	–50...+180 °C	IP65 *	1101-6030-5281-120	**39,43 €**
HTF50 Pt1000 PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6030-5301-110	**33,37 €**
HTF50 Pt1000 Silikon 10M	**Silicone**	**10 m**	–50...+180 °C	IP65 *	1101-6030-5301-120	**45,28 €**
HTF50 PT1000 A					**Pt 1000 A, class A-TGA**	
HTF50 Pt1000A PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-6211-110	**24,35 €**
HTF50 Pt1000A Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-6211-120	**27,96 €**
HTF50 NI1000					**Ni 1000**	
HTF50 Ni1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6030-9211-110	**16,13 €**
HTF50 Ni1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6030-9211-120	**20,09 €**
HTF50 Ni1000 PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6030-9231-110	**19,10 €**
HTF50 Ni1000 Silikon 3M	**Silicone**	**3 m**	–50...+180 °C	IP65 *	1101-6030-9231-120	**24,46 €**
HTF50 Ni1000 PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6030-9251-110	**23,05 €**
HTF50 Ni1000 Silikon 5M	**Silicone**	**5 m**	–50...+180 °C	IP65 *	1101-6030-9251-120	**30,31 €**
HTF50 Ni1000 PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6030-9281-110	**28,96 €**
HTF50 Ni1000 Silikon 8M	**Silicone**	**8 m**	–50...+180 °C	IP65 *	1101-6030-9281-120	**39,11 €**
HTF50 Ni1000 PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6030-9301-110	**32,90 €**
HTF50 Ni1000 Silikon 10M	**Silicone**	**10 m**	–50...+180 °C	IP65 *	1101-6030-9301-120	**44,96 €**
HTF50 NITK					**Ni 1000 TK 5000**	
HTF50 NiTK PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-0211-110	**20,33 €**
HTF50 NiTK Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-0211-120	**23,99 €**
HTF50 NiTK PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-0231-110	**23,31 €**
HTF50 NiTK Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-0231-120	**28,39 €**
HTF50 NiTK PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-0251-110	**27,25 €**
HTF50 NiTK Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-0251-120	**34,23 €**
HTF50 NiTK PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-0281-110	**33,17 €**
HTF50 NiTK Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-0281-120	**43,03 €**
HTF50 NiTK PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-0301-110	**37,11 €**
HTF50 NiTK Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-0301-120	**48,88 €**
HTF50 LM235Z					**LM 235 Z**	
HTF50 LM235Z PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6032-1211-110	**14,44 €**
HTF50 LM235Z Silikon 1,5M	**Silicone**	**1.5 m**	**– 40...+125 °C**	IP65 *	1101-6032-1211-120	**18,38 €**
HTF50 LM235Z PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6032-1231-110	**17,39 €**
HTF50 LM235Z Silikon 3M	**Silicone**	**3 m**	**– 40...+125 °C**	IP65 *	1101-6032-1231-120	**22,75 €**
HTF50 LM235Z PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6032-1251-110	**21,35 €**
HTF50 LM235Z Silikon 5M	**Silicone**	**5 m**	**– 40...+125 °C**	IP65 *	1101-6032-1251-120	**28,60 €**
HTF50 LM235Z PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6032-1281-110	**27,26 €**
HTF50 LM235Z Silikon 8M	**Silicone**	**8 m**	**– 40...+125 °C**	IP65 *	1101-6032-1281-120	**37,41 €**
HTF50 LM235Z PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6032-1301-110	**31,21 €**
HTF50 LM235Z Silikon 10M	**Silicone**	**10 m**	**– 40...+125 °C**	IP65 *	1101-6032-1301-120	**43,26 €**

Continued on next page ...

THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)

Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
HTF50 NTC1.8K					**NTC 1.8K**	
HTF50 NTC1,8K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-2211-110	**13,64 €**
HTF50 NTC1,8K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-2211-120	**15,67 €**
HTF50 NTC1,8K PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-2231-110	**16,61 €**
HTF50 NTC1,8K Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-2231-120	**20,09 €**
HTF50 NTC1,8K PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-2251-110	**20,56 €**
HTF50 NTC1,8K Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-2251-120	**25,94 €**
HTF50 NTC1,8K PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-2281-110	**26,46 €**
HTF50 NTC1,8K Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-2281-120	**34,70 €**
HTF50 NTC1,8K PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-2301-110	**30,42 €**
HTF50 NTC1,8K Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-2301-120	**40,57 €**
HTF50 NTC10K					**NTC 10K**	
HTF50 NTC10K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-5211-110	**13,64 €**
HTF50 NTC10K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-5211-120	**15,67 €**
HTF50 NTC10K PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-5231-110	**16,61 €**
HTF50 NTC10K Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-5231-120	**20,09 €**
HTF50 NTC10K PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-5251-110	**20,56 €**
HTF50 NTC10K Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-5251-120	**25,94 €**
HTF50 NTC10K PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-5281-110	**26,46 €**
HTF50 NTC10K Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-5281-120	**34,70 €**
HTF50 NTC10K PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-5301-110	**30,42 €**
HTF50 NTC10K Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-5301-120	**40,57 €**
HTF50 NTC20K					**NTC 20K**	
HTF50 NTC20K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6031-6211-110	**13,64 €**
HTF50 NTC20K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6031-6211-120	**15,67 €**
HTF50 NTC20K PVC 3M	**PVC**	**3 m**	–35...+105 °C	IP65 *	1101-6031-6231-110	**16,61 €**
HTF50 NTC20K Silikon 3M	**Silicone**	**3 m**	**– 50...+150 °C**	IP65 *	1101-6031-6231-120	**20,09 €**
HTF50 NTC20K PVC 5M	**PVC**	**5 m**	–35...+105 °C	IP65 *	1101-6031-6251-110	**20,56 €**
HTF50 NTC20K Silikon 5M	**Silicone**	**5 m**	**– 50...+150 °C**	IP65 *	1101-6031-6251-120	**25,94 €**
HTF50 NTC20K PVC 8M	**PVC**	**8 m**	–35...+105 °C	IP65 *	1101-6031-6281-110	**26,46 €**
HTF50 NTC20K Silikon 8M	**Silicone**	**8 m**	**– 50...+150 °C**	IP65 *	1101-6031-6281-120	**34,70 €**
HTF50 NTC20K PVC 10M	**PVC**	**10 m**	–35...+105 °C	IP65 *	1101-6031-6301-110	**30,42 €**
HTF50 NTC20K Silikon 10M	**Silicone**	**10 m**	**– 50...+150 °C**	IP65 *	1101-6031-6301-120	**40,57 €**
Extra charge:	* Protection type **IP68** (Sensor sleeve watertight compound-filled)					**3,50 €**
	Other sensors optional				on request	
	Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths)				on request	
	Connection type **4-wire** (4-conductor)				on request	
For special orders please specify: (possible for 25 or more pieces)	Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e. g. HTF - 30mm, Pt1000, PVC, 2-wire, 10 m, IP68; HTF - 50mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP65					



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection



IP54 (optional)
with **glass fibre** cable

HTF 50
(NL = 50 mm)
with PVC / silicone cable



HTF 50
(NL = 50 mm)
with glass fibre cable



THERMASGARD® HTF 200

Sleeve sensor / cable temperature sensor
duct / immersion / screw-in temperature sensor,
with passive output

S+S REGELTECHNIK

THERMASGARD® HTF 200 sleeve sensor / cable temperature sensor (NL = 200 mm)						
Type / WG03	**Cable material**	**Cable length**	**Measuring Range**	**Protection class**	**Item No. Sensor**	**Price**
HTF200 PT100					**Pt 100, class B**	
HTF200 Pt100 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-1211-110	**20,98 €**
HTF200 Pt100 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-1211-120	**24,92 €**
HTF200 PT1000					**Pt 1000, class B**	
HTF200 Pt1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-5211-110	**20,98 €**
HTF200 Pt1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-5211-120	**24,92 €**
HTF200 PT1000 A					**Pt 1000 A, class A-TGA**	
HTF200 Pt1000A PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-6211-110	**28,55 €**
HTF200 Pt1000A Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-6211-120	**32,51 €**
HTF200 NI1000					**Ni 1000**	
HTF200 Ni1000 PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6090-9211-110	**21,38 €**
HTF200 Ni1000 Silikon 1,5M	**Silicone**	**1.5 m**	–50...+180 °C	IP65 *	1101-6090-9211-120	**24,92 €**
HTF200 NI TK					**Ni 1000 TK 5000**	
HTF200 NiTK PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-0211-110	**22,43 €**
HTF200 NiTK Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-0211-120	**25,97 €**
HTF200 LM235Z					**LM 235 Z**	
HTF200 LM235Z PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6092-1211-110	**21,63 €**
HTF200 LM235Z Silikon 1,5M	**Silicone**	**1.5 m**	**– 40...+125 °C**	IP65 *	1101-6092-1211-120	**25,57 €**
HTF200 NTC1,8K					**NTC 1.8K**	
HTF200 NTC1,8K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-2211-110	**20,98 €**
HTF200 NTC1,8K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-2211-120	**24,92 €**
HTF200 NTC10K					**NTC 10K**	
HTF200 NTC10K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-5211-110	**20,98 €**
HTF200 NTC10K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-5211-120	**24,92 €**
HTF200 NTC20K					**NTC 20K**	
HTF200 NTC20K PVC 1,5M	**PVC**	**1.5 m**	–35...+105 °C	IP65 *	1101-6091-6211-110	**20,98 €**
HTF200 NTC20K Silikon 1,5M	**Silicone**	**1.5 m**	**– 50...+150 °C**	IP65 *	1101-6091-6211-120	**24,92 €**
Extra charge:	*	Protection type **IP 68** (Sensor sleeve watertight compound-filled)				**3,50 €**
		Other sensors optional			on request	
		Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths)			on request	
		Connection type **4-wire** (4-conductor)			on request	
For special orders please specify: (possible for 25 or more pieces)		Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e. g. HTF-200 mm, Pt1000, PVC, 2-wire, 10 m, IP68; HTF-400 mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP65				



HTF 200
(NL = 200 mm)
with PVC/silicone cable



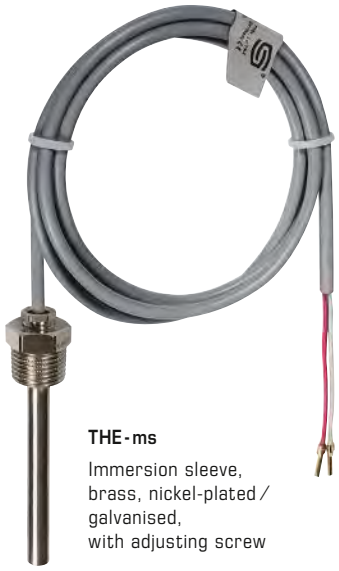
IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® HTF 50 accessory as immersion / screw-in sensor temperature sensor (ESTF)				
Type / WG01	**Description**		**Item No.**	**Price**
THE-ms / xx				
	Immersion sleeve, brass, nickel-plated / galvanised, Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5			
THE-MS 50MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **50 mm**	7100-0011-6010-002	**10,77 €**
THE-MS 100MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **100 mm**	7100-0011-6020-002	**11,64 €**
THE-MS 150MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **150 mm**	7100-0011-6030-002	**12,07 €**
THE-MS 200MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **200 mm**	7100-0011-6040-002	**12,92 €**
THE-MS 250MM	p_{max} = 16 bar, T_{max} = +130 °C	EL = **250 mm**	7100-0011-6050-002	**14,47 €**
THE-VA / xx				
	Immersion sleeve, stainless steel, V4A (1.4571), Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with **adjusting screw** M12 x 1.5			
THE-VA 50MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **50 mm**	7100-0012-6010-002	**21,32 €**
THE-VA 100MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **100 mm**	7100-0012-6020-002	**23,55 €**
THE-VA 150MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **150 mm**	7100-0012-6030-002	**25,29 €**
THE-VA 200MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **200 mm**	7100-0012-6040-002	**26,67 €**
THE-VA 250MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **250 mm**	7100-0012-6050-002	**33,15 €**
THE-VA 300MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **300 mm**	7100-0012-6060-002	**34,63 €**
THE-VA 400MM	p_{max} = 40 bar, T_{max} = +200 °C	EL = **400 mm**	7100-0012-6080-002	**35,75 €**
xx = (EL)	Other installation lengths on request			

HTF 50
(NL = 50 mm)
with **THE** immersion sleeve
as immersion / screw-in temperature sensor



THE-ms
Immersion sleeve,
brass, nickel-plated /
galvanised,
with adjusting screw



THE-VA
Immersion sleeve,
stainless steel, V4A,
with adjusting screw

MF-06-K
Mounting flange,
plastic
(optional)



THERMASGARD® HTF 50 accessories (standard) THERMASGARD® HTF 200 accessories (standard)				
Type / WG01	**Description**	T_{max}	**Item No.**	**Price**
MF				
MF-06-K	**Mounting flange** plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland (**not** included in scope of delivery)	+100 °C	7100-0030-1000-000	**6,30 €**
Note:	For further information see last chapter!			

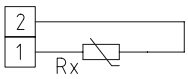
THERMASGARD® OFTF

Surface contact temperature sensors /
surface temperature sensors,
with passive output

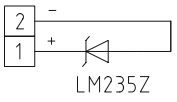
S+S REGELTECHNIK

Small surface contact resistance thermometer in aluminium enclosure (cable sensor).
The surface sensor **THERM**ASGARD® **OFTF** is used for temperature detection on flat or slightly convex surfaces, for instance for surface temperature measurement at windows, for monitoring formation of condensate, or as heating surface sensor, e.g. at windows or walls.

1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



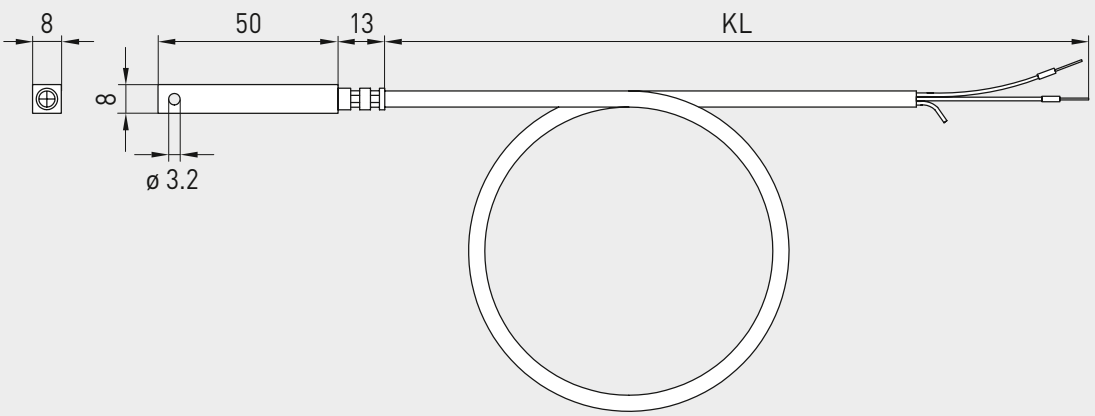
TECHNICAL DATA

Measuring range:	–30...+105 °C
Sensors / output:	see table, passive (**Perfect Sensor Protection** with IP68)
Connection type:	2-wire connection
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Process connection:	attachment to the surface to be measured through fixing hole in the sensor head or by suitable adhesive
Protective sleeve:	aluminium
Dimensions:	8 x 8 x 50 mm
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm², ends stripped with wire end sleeves (optional with silicone cable SiHF, up to +180 °C)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)

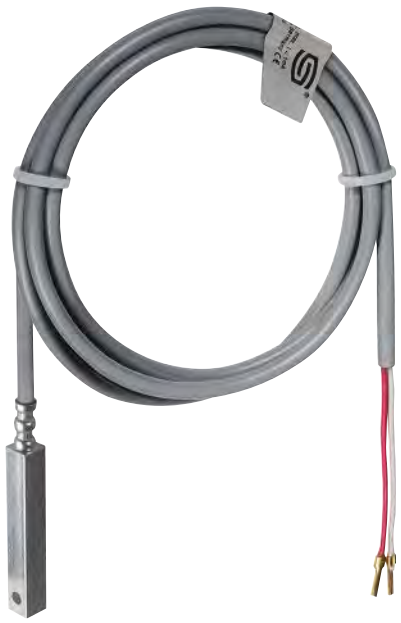
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Dimensional drawing **OFTF**



OFTF



THERMASGARD® OFTF	Surface contact temperature sensors / surface temperature sensors		
Type / WG03	**Sensor / output**	**Item No.**	**Price**
OFTF		**IP 65**	
OFTF Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6010-1211-110	**38,10 €**
OFTF Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6010-5211-110	**38,10 €**
OFTF Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6010-9211-110	**40,30 €**
OFTF NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6011-0211-110	**44,57 €**
OFTF LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6012-1211-110	**38,84 €**
OFTF NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6011-2211-110	**36,64 €**
OFTF NTC10K PVC 1,5M	NTC 10K	1101-6011-5211-110	**36,64 €**
OFTF NTC20K PVC 1,5M	NTC 20K	1101-6011-6211-110	**36,64 €**
Extra charge:	Protection type **IP 68** (sensor sleeve watertight compound-filled) 2-wire connecting leads (**PVC / silicone**) per running metre 4-wire connecting leads (**PVC / silicone**) per running metre	 on request on request	**3,50 €**
For special orders please specify:	Type, sensor type, cable length e.g. OFTF Pt100, 3 m; OFTF Pt100 1 / 3 DIN, 4 m; OFTF KTY 81-210, 6 m		

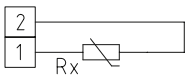
THERMASGARD® ALTF 1

Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

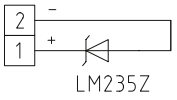
S+S REGELTECHNIK

THERMASGARD® **ALTF 1** surface contact sensors are electric contact thermometers and are used for measuring surface temperatures of solids, having at least one so-called contact area that is brought into contact with the surface to be measured. The surface contact temperature sensor ALTF 1 with connection cable and passive output determines the temperature of a medium flowing inside a pipe (e.g. water temperature) via the surface temperature. ALTF 1 is a tube contact resistance thermometer with strap and axial feeler tube for measuring temperature on piping and tubes (e.g. cold-water and hot-water), or at heating sections for heating system control.

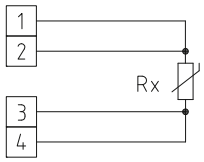
1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



1x four-wire connection (optional)



TECHNICAL DATA

Measuring range:	–35...+105 °C PVC –35...+180 °C silicone (T_{max} NTC = +150 °C, T_{max} LM 235 Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) (**Perfect Sensor Protection** with IP68)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm² or silicone, SiHF, 2 x 0.25 mm² ends stripped, with wire end sleeves
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Process connection:	with **endless strap** with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"); length 300 mm
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (PVC)

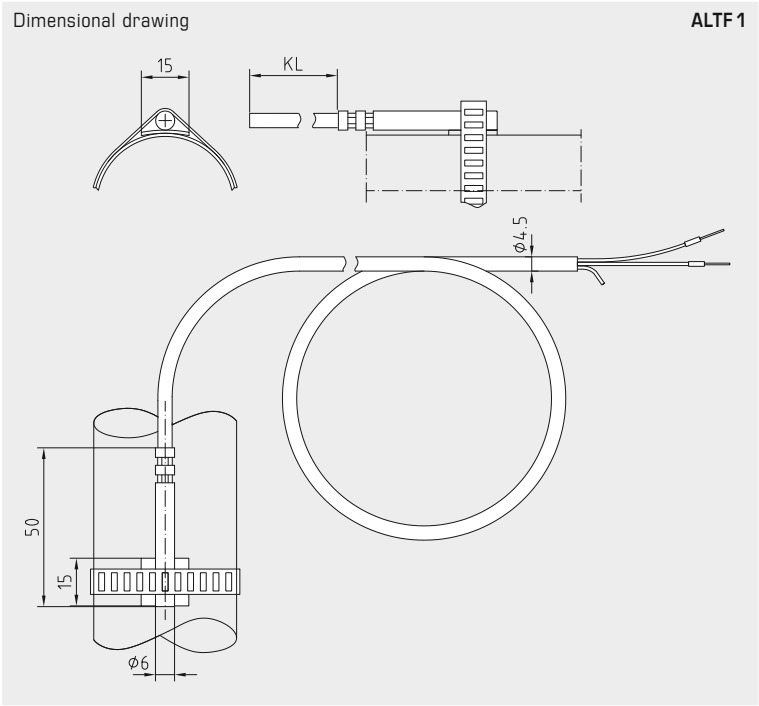
Type / WG03	Sensor / Output	Item No.	Price
ALTF 1 xx PVC		**IP 65, PVC**	
ALTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-110	**20,86 €**
ALTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-110	**20,86 €**
ALTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6020-9211-110	**21,63 €**
ALTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-110	**22,43 €**
ALTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-110	**22,03 €**
ALTF1 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6021-2211-110	**21,38 €**
ALTF1 NTC10K PVC 1,5M	NTC 10K	1101-6021-5211-110	**21,38 €**
ALTF1 NTC20K PVC 1,5M	NTC 20K	1101-6021-6211-110	**21,38 €**
Note:	including strap, connecting cable **PVC** (KL = 1.5 m)		
Extra charge:	Protection type **IP 68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**PVC**) Other sensors optional	 on request on request	**3,50 €**

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**

Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

Dimensional drawing **ALTF 1**



ALTF 1



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (silicone)			
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ALTF 1 xx SILIKON		**IP65, silicone**	
ALTF1 Pt100 Silikon 1,5M	Pt100 (according to DIN EN 60751, class B)	1101-6020-1211-120	**21,63 €**
ALTF1 Pt1000 Silikon 1,5M	Pt1000 (according to DIN EN 60751, class B)	1101-6020-5211-120	**21,63 €**
ALTF1 Ni1000 Silikon 1,5M	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-6020-9211-120	**23,09 €**
ALTF1 NiTK Silikon 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-120	**24,27 €**
ALTF1 LM235Z Silikon 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-120	**22,43 €**
ALTF1 NTC1,8K Silikon 1,5M	NTC 1.8 K	1101-6021-2211-120	**22,30 €**
ALTF1 NTC10K Silikon 1,5M	NTC 10K	1101-6021-5211-120	**22,30 €**
ALTF1 NTC20K Silikon 1,5M	NTC 20K	1101-6021-6211-120	**22,30 €**
Note:	including strap, connecting cable **silicone** (KL = 1.5 m)		
Extra charge:	Protection type **IP68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**silicone**) Other sensors optional	 on request on request	**3,50 €**

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**

THERMASGARD® ALTF 2
THERMASGARD® ALTF 02

Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

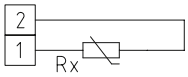
S+S REGELTECHNIK

THERMASGARD® **ALTF 2** is a tube contact resistance thermometer with passive output, in an impact-resistant plastic housing with quick-locking screws, incl.strap.

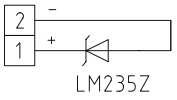
THERMASGARD® **ALTF 02** is a cost-saving tube contact resistance thermometer with passive output, in an impact-resistant plastic housing with snap-on lid, incl.strap.

Surface contact sensors are electric contact thermometers used for surface temperature measurement on solids, having at least one so-called contact area that is brought into contact with the surface to be measured. This surface contact temperature sensor measures the temperature of a medium flowing inside a pipe (e.g. the water temperature). This tube surface sensor is used for measuring temperature on piping and tubes (e.g. cold-water and hot-water), wor on heating sections for heating system control.

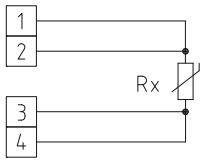
1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



1x four-wire connection (optional)





TECHNICAL DATA

Measuring range:	–30...+110 °C
Sensors / output:	see table, passive (**Perfect Sensor Protection**) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100 / PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), **ALTF 02 with snap-on lid,** **ALTF 2 with quick-locking screws** (slotted / Phillips head combination)
Dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	with **endless strap** with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), length L = 300 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**ALTF 02 IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **ALTF 2 IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

THERMASGARD® ALTF 02 — Surface contact temperature sensors / tube contact temperature sensors, *Standard* including strap, with snap-on lid

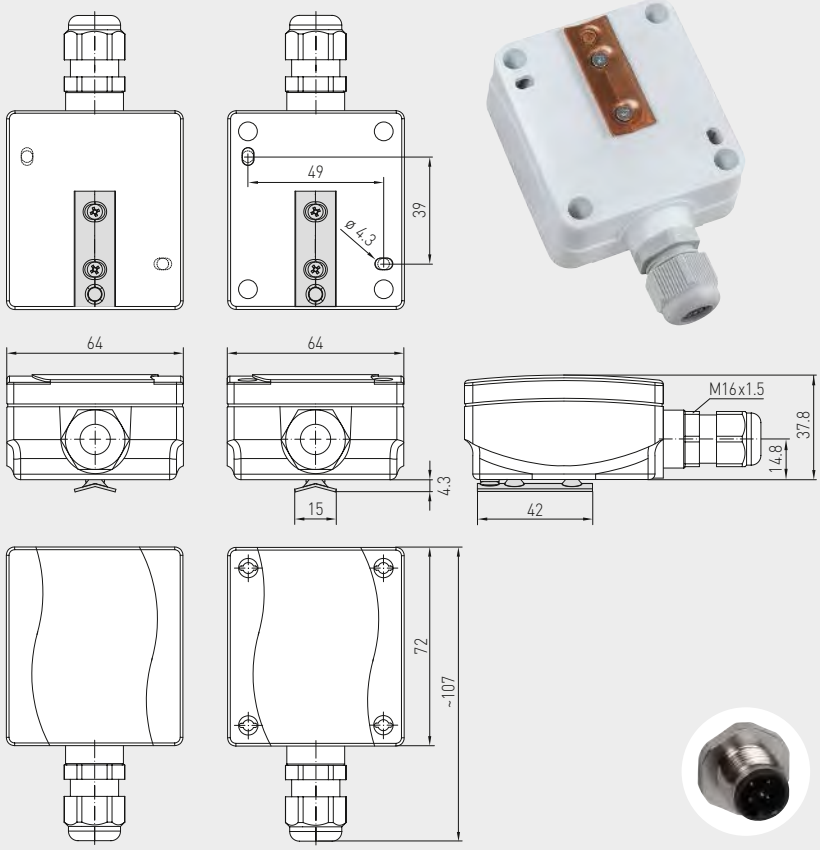
Type / WG03B	Sensor / Output	Item No.	Price
ALTF 02		**IP 54**	
ALTF02 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1010-1003-000	**22,30 €**
ALTF02 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1010-5001-000	**22,30 €**
ALTF02 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1010-9001-000	**22,68 €**
ALTF02 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1011-0001-000	**25,97 €**
ALTF02 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1012-1001-000	**22,95 €**
ALTF02 NTC1,8K	NTC 1.8 K	1101-1011-2001-000	**21,63 €**
ALTF02 NTC10K	NTC 10K	1101-1011-5001-000	**21,63 €**
ALTF02 NTC20K	NTC 20K	1101-1011-6001-000	**21,63 €**
Extra charge:	two or other sensors optional cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**

Dimensional drawing

ALTF 2
ALTF 02



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)



ALTF 02
with snap-on lid
(IP 54)



ALTF 2
with quick-locking screws
(IP 65)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTF 2	Surface contact temperature sensors / tube contact temperature sensors, *Premium* including strap, with quick-locking screws		
Type / WG03	**Sensor / Output**	**Item No.**	**Price**
ALTF 2		**IP 65**	
ALTF2 Pt100	Pt100 (according to DIN EN 60751, class B)	1101-1020-1003-000	**25,89 €**
ALTF2 Pt1000	Pt1000 (according to DIN EN 60751, class B)	1101-1020-5001-000	**26,63 €**
ALTF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1020-6003-000	**30,28 €**
ALTF2 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-1020-9001-000	**26,25 €**
ALTF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1021-0001-000	**30,78 €**
ALTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1022-1001-000	**25,40 €**
ALTF2 NTC1,8K	NTC 1.8 K	1101-1021-2001-000	**22,09 €**
ALTF2 NTC10K	NTC 10K	1101-1021-5001-000	**22,09 €**
ALTF2 NTC20K	NTC 20K	1101-1021-6001-000	**22,09 €**
Extra charge:	two or other sensors optional cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**

Pendulum room temperature sensors with passive output

S+S REGELTECHNIK

Resistance thermometer **THERM**ASGARD® **RPTF 1** with passive output is specifically used for temperature detection in larger rooms and halls. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, excellent and room-representative measuring results are achieved as ambient air of the room is steadily washing around the sensor.

RPTF 1

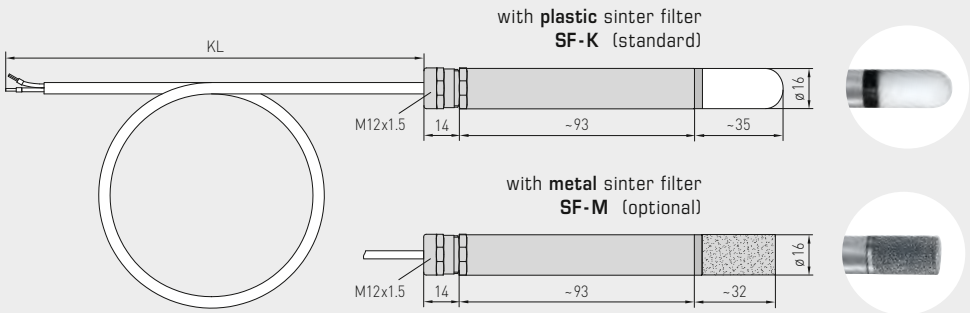


TECHNICAL DATA

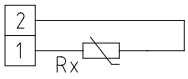
Measuring range:	–5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø =16 mm, NL = 142 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)

1x four-wire connection (optional)

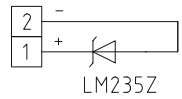
Dimensional drawing **RPTF 1**



1x two-wire connection **standard**



1x two-wire connection **LM 235 Z (KP 10)**



THERMASGARD® RPTF 1 Pendulum room temperature sensors (with metal sleeve)

Type / WG03	Sensor / Output	Item No.	Price
RPTF 1		**IP 65**	
RPTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6060-1211-010	**60,44 €**
RPTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6060-5211-010	**63,61 €**
RPTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6060-9211-010	**62,54 €**
RPTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6061-0211-010	**66,48 €**
RPTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6062-1211-110	**60,59 €**
RPTF1 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6061-2211-010	**66,23 €**
RPTF1 NTC10K PVC 1,5M	NTC 10K	1101-6061-5211-010	**66,23 €**
RPTF1 NTC20K PVC 1,5M	NTC 20K	1101-6061-6211-010	**66,23 €**
ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
Extra charge:	2-wire connecting leads, per running meter (**PVC**) 4-wire connecting leads, per running meter (**PVC**)	on request on request	
For special orders please specify:	Type, sensor type and cable length e. g. RPTF1 Pt100, 3 m; RPTF1 Pt1000, 4 m; RPTF1 KTY 81-210, 6 m		

Resistance thermometer **THERM**ASGARD® **RPTF 2** with passive output is specifically used for temperature detection in larger rooms and halls, as dark radiation sensor for example. The pendulum room sensor RPTF-2 (globe thermometer) determines the effective portion of active radiation or also the effective radiant heat at the measured location. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, an excellent and room-representative measuring result is achieved. The globe temperature is determined to take heat radiation into consideration and to estimate the degree of thermal comfort (operative room temperature).
The operative room temperature describes the coaction of heat radiation and heat convection (the ratio of globe temperature / air temperature is approx. 70 % / 30 %).

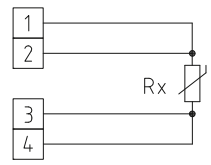
RPTF 2



TECHNICAL DATA

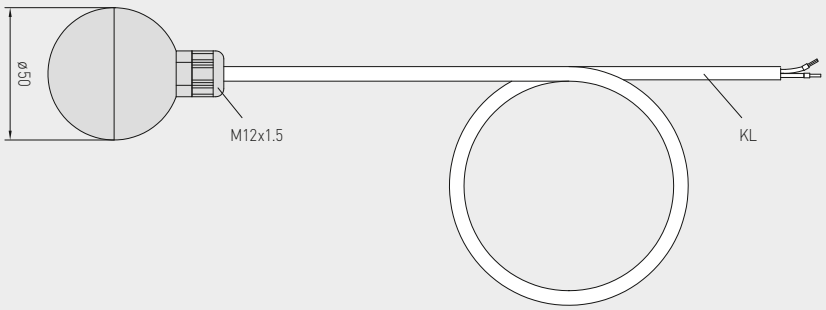
Measuring range:	–5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Globe:	plastic, colour black, Ø = 50 mm
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)

1x four-wire connection
(optional)

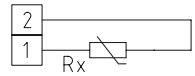


Dimensional drawing

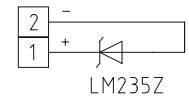
RPTF 2



1x two-wire connection
standard



1x two-wire connection
LM 235 Z (KP 10)



THERMASGARD® RPTF 2 Pendulum room temperature sensors (with globe)

Type / WG03	Sensor / Output	Item No.	Price
RPTF 2		**IP 65**	
RPTF2 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6070-1211-010	**60,59 €**
RPTF2 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6070-5211-010	**63,73 €**
RPTF2 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6070-9211-010	**62,67 €**
RPTF2 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6071-0211-010	**66,60 €**
RPTF2 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6072-1211-010	**60,72 €**
RPTF2 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6071-2211-010	**66,35 €**
RPTF2 NTC10K PVC 1,5M	NTC 10K	1101-6071-5211-010	**66,35 €**
RPTF2 NTC20K PVC 1,5M	NTC 20K	1101-6071-6211-010	**66,35 €**
Extra charge::	2-wire connecting leads, per running meter (**PVC**) 4-wire connecting leads, per running meter (**PVC**)	on request on request	
For special orders please specify:	Type, sensor type and cable length e. g. RPTF2 Pt100, 3 m; RPTF2 Pt1000, 4 m; RPTF2 KTY 81-210, 6 m		

S+S REGELTECHNIK

On-wall radiation temperature sensors with passive output

Resistance thermometer **THERM**ASGARD® **ASTF** with passive output, terminal box housing made of impact-resistant plastic and housing cover with quick-locking screws. This radiation sensor is specifically designed for temperature detection in wet areas or in larger rooms or halls. The on-wall radiation temperature sensor ASTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, excellent and room-representative measuring results are achieved.

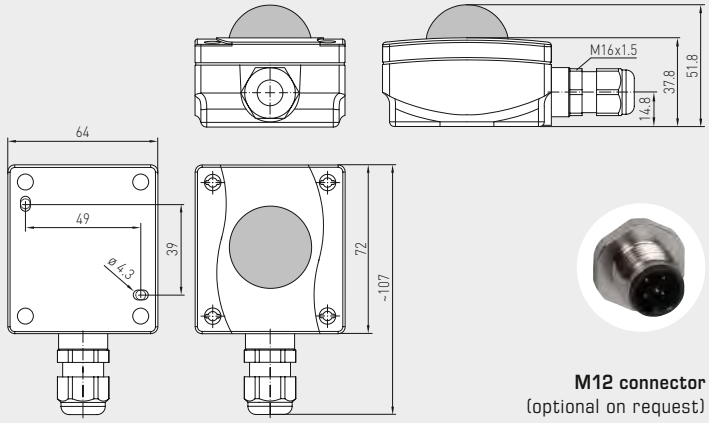
ASTF



TECHNICAL DATA

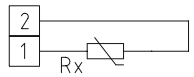
Measuring range:	–30 ...+ 75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), semi-globe: black
Housing dimensions:	72 x 64 x 37.8 (51.8) mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

Dimensional drawing **ASTF**

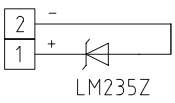


M12 connector
(optional on request)

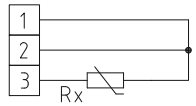
1x two-wire connection **standard**



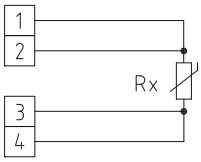
1x two-wire connection **LM 235 Z (KP 10)**



1x three-wire connection (optional)



1x four-wire connection (optional)



THERMASGARD® ASTF On-wall radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
ASTF		**IP 65**	
ASTF Pt100	Pt100 (according to DIN EN 60 751, B)	1101-1060-1003-000	**72,60 €**
ASTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1060-5001-000	**72,60 €**
ASTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1060-9001-000	**73,88 €**
ASTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1061-0001-000	**76,32 €**
ASTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1062-1001-000	**71,26 €**
ASTF NTC1,8K	NTC 1.8 K	1101-1061-2001-000	**76,32 €**
ASTF NTC10K	NTC 10K	1101-1061-5001-000	**76,32 €**
ASTF NTC20K	NTC 20K	1101-1061-6001-000	**76,32 €**
Extra charge:	two or other sensors optional cable connection with **M12 connector** according to DIN EN 61076-2-101	on request on request	

Resistance thermometer **THERM**ASGARD® **RSTF** with passive output in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, specifically used for temperature detection in larger rooms. The room radiation temperature sensor RSTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, an excellent and room-representative measuring result is achieved. In addition there is an independent passive output available to determinate the reference temperature.

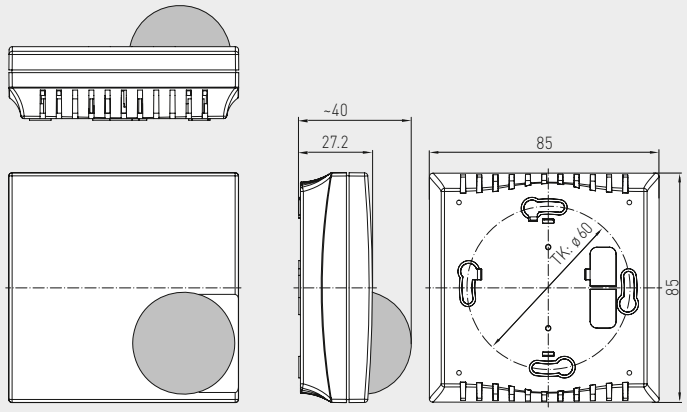
RSTF



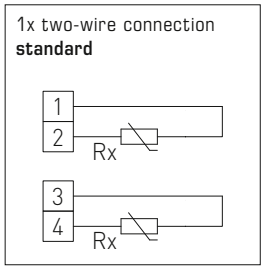
TECHNICAL DATA

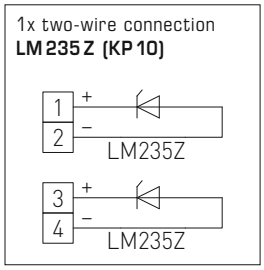
Measuring range:	–30...+75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, material ABS Housing: pure white (similar to RAL 9010), Semi-globe: black
Dimensions:	85 x 85 x 27 (40) mm (Baldur 1)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)

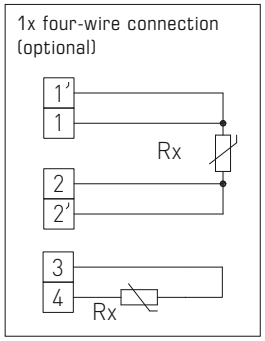
Dimensional drawing **RSTF**

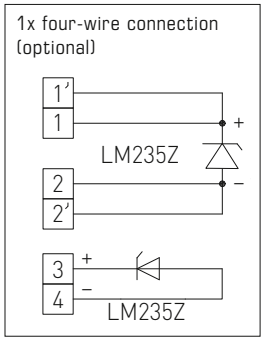


Terminals 3 and 4:
Sensor for reference temperature









THERMASGARD® RSTF Room radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
RSTF		**IP 30**	
RSTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40C0-1003-000	**71,26 €**
RSTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40C0-5001-000	**71,26 €**
RSTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40C0-9001-000	**73,88 €**
RSTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40C1-0001-000	**75,96 €**
RSTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40C2-1001-000	**71,26 €**
RSTF NTC1,8K	NTC 1.8 K	1101-40C1-2001-000	**75,19 €**
RSTF NTC10K	NTC 10K	1101-40C1-5001-000	**75,19 €**
RSTF NTC20K	NTC 20K	1101-40C1-6001-000	**75,19 €**
Extra charge:	two or other sensors optional	on request	

Temperature

THERMASGARD® **active sensors** – precise thermal management

Our active temperature sensors are easy to install, versatile and meet all requirements important to you.

Adjustable and calibratable temperature transmitters with self-diagnostics provide additional flexibility.

Application Areas

- Hospitals, museums, schools, hotels, public authorities, institutes and banks
- Sports arenas, holiday centers and movie theaters
- Car dealers
- Ships and shipyards
- Industrial plants and assembly halls
- Power plants and refineries





THERMASGARD®
ACTIVE TEMPERATURE SENSORS

Room sensors, room control units

RTM 1	Room temperature measuring transducer	AOS	**263**
RTM xx	Room temperature measuring transducer / Room control units	AOS	**263**
FSTM	Room temperature measuring transducer, in-wall		**267**
FSTM-P	Room control units, in-wall		**267**
RPTM 1	Pendulum room temperature measuring transducer	AOS	**329**
RPTM 2	Pendulum room temperature measuring transducer	AOS	**333**

Outdoor sensors, on-wall sensors

ATM 2	Outside temperature measuring transducer	AOS	**271**
ATM 2-VA	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	AOS	**275**

Cable sensors, surface-contact sensors

HFTM	Sleeve sensor with cable, temperature measuring transducer	AOS	**309**
HFTM-VA	Sleeve sensor with cable, temperature measuring transducer (Stainless steel housing Tyr 2E)	AOS	**313**
ALTM 1	Surface-contact temperature measuring transducer	AOS	**317**
ALTM 2	Surface-contact temperature measuring transducer with cable	AOS	**321**
ALTM 2-VA	Surface-contact temperature measuring transducer with cable (Stainless steel housing Tyr 2E)	AOS	**325**

Duct / immersion / screw-in sensors

TM 43	Duct / immersion / screw-in temperature measuring transducer	AOS	**279**
TM 65	Duct / immersion / screw-in temperature measuring transducer	AOS	**279**
TM 54	Duct / immersion / screw-in temperature measuring transducer		**289**
RGTM 2	Smoke gas temperature measuring transducer, screw-in sensor		**303**
RGTM 1	Smoke gas temperature measuring transducer, duct sensor		**297**
MWTM	Mean-value temperature measuring transducer, rod sensor	AOS	**285**
MWTM-SD	Mean-value temperature measuring transducer, rod sensor	AOS	**285**

Immersion sleeves and accessories

see chapter Accessories	**638**



NEW

S+S REGELTECHNIK

Room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERM**ASGARD® **RTM 1**, with eight switchable measuring ranges (max. –20...+150 °C), active output, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. Optionally available as a design with vandal-proof housing made of stainless steel (top and base screwed together).

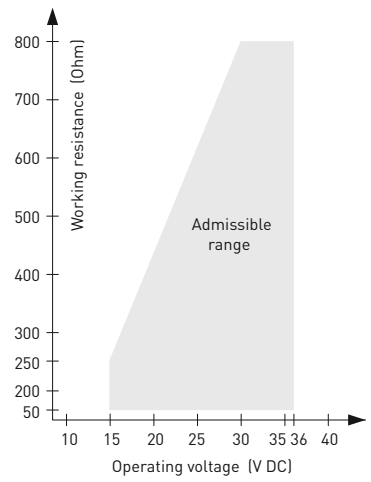
The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

This room temperature sensor is used to detec temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

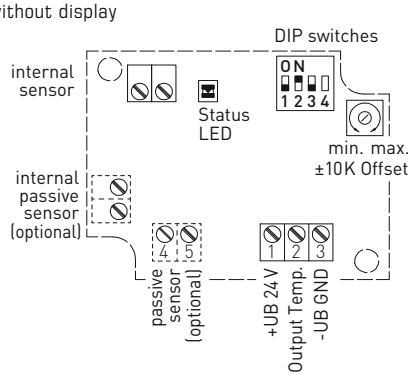
TECHNICAL DATA

RTM 1 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
RTM 1 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1,0 W / 24 V DC; < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching with 8 measuring ranges** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B
Deviation, temperature:	typically ± 0.2 K at +25 °C
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optional stainless steel **V2A** (1.4301)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel)
Electrical connection:	0.14 - 1.5 mm², via terminal screws on circuit board
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU

Load resistance diagram (2-wire) **RTM xx - I**



Schematic diagram without display **RTM 1**



2-wire without display **RTM 1 - I**



+UB 24V DC
Output Temp. 4...20mA
free

3-wire (AOS) without display **RTM 1 - A**



+UB 24V AC/DC
Output Temp. 0-10V / 4...20mA
–UB GND

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+ 150 °C	**ON**	**ON**	**ON**
–50... + 50 °C	OFF	**ON**	**ON**
–20... + 80 °C	**ON**	OFF	**ON**
–30... + 60 °C	OFF	OFF	**ON**
0... + 40 °C	**ON**	**ON**	OFF
0... + 50 °C (default)	OFF	**ON**	OFF
0...+ 100 °C	**ON**	OFF	OFF
0...+ 150 °C	OFF	OFF	OFF

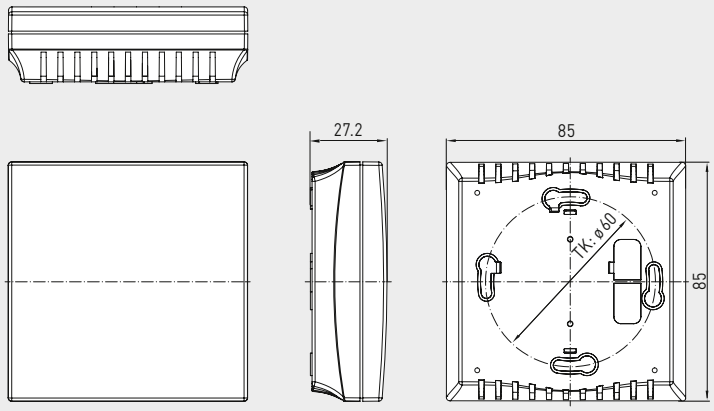
DIP4 has no function!

For further technical information, see the operating instructions

Room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

Dimensional drawing
[mm]

Housing **Baldur 1**

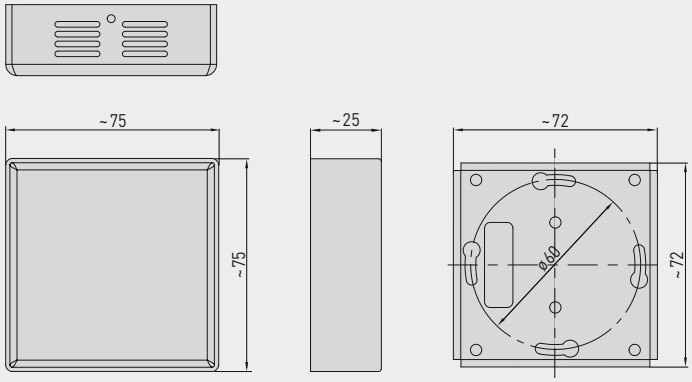


RTM 1
without display
(Baldur 1)



Dimensional drawing
[mm]

Housing **stainless steel**



RTM 1
without display
(stainless steel)



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® **RTM 1**	Room temperature measuring transducers with multi-range switching (without display)			
Type / WG01	**Output**	**Features**	**Item No.**	**Price**
RTM1 - I	**(2-wire)**			
RTM1-I	4...20 mA	–	1101-41A2-0000-200	**78,89 €**
RTM1-I VA	4...20 mA	Stainless steel housing **V2A** (1.4301)	1101-4152-0000-200	**205,23 €**
RTM1 - A	**(3-wire AOS)**			
RTM1-A	0-10 V / 4...20 mA	–	1101-41AE-0000-200	**78,89 €**
RTM1-A VA	0-10 V / 4...20 mA	Stainless steel housing **V2A** (1.4301)	1101-415E-0000-200	**205,23 €**
Automatic Output Switching:	patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Measuring range:	**multi-range switching** with 8 switchable measuring ranges (see DIP table) 0...+ 50 °C (default), max. –20...+150 °C			
Extra charge:	other measuring ranges optional additional passive sensor (pin 4/5) optionally upon request			**26,16 €**
Note:	for units **with display** and/or potentiometer, see the following pages			

THERMASGARD® RTM xx

Room temperature measuring transducers, calibratable, with display and / or potentiometer and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERM**ASGARD® **RTM xx** with active output, temperature range (0...+50 °C), in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, optionally with potentiometer and/or display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I) with 2-wire connection and I output is available.

This room temperature sensor is used to detec temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RTM xx
without potentiometer, with display



SI IMP

TECHNICAL DATA

RTM - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
RTM - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm for AOS I variant R_L > 15 kOhm for AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**0...+50 °C** (other ranges optional) **with manual zero point correction (± 10 K)**
Sensor:	digital temperature sensor
Deviation, temperature:	typically ± 0.2 K at +25 °C
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Control element:	**potentiometer**, with angle of rotation limiter, the standard marking is a swelling arrow with centre position, unfilled (others upon request)
Optional:	Two-line **display with illumination**, cutout 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (sensor breakage, sensor short circuit)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Temperature [°C]



Temperature [°F]



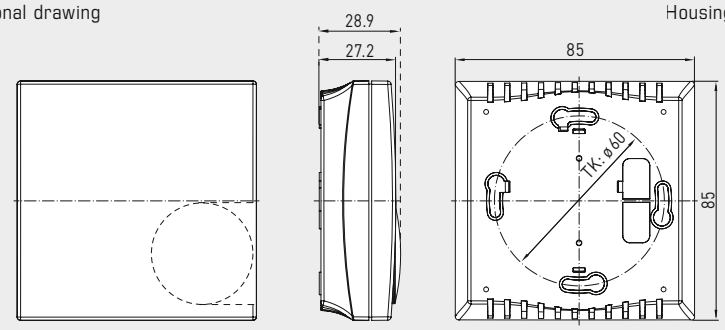
Sensor breakage



Sensor short circuit

Dimensional drawing [mm]

Housing **Baldur 1**



Display (switchable)		DIP 1
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

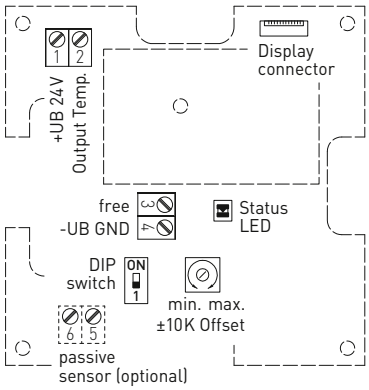
Display
Temperature [°C] → [°F]
The display value depends on the set unit system (**DIP 1**).

For further technical information, see the operating instructions

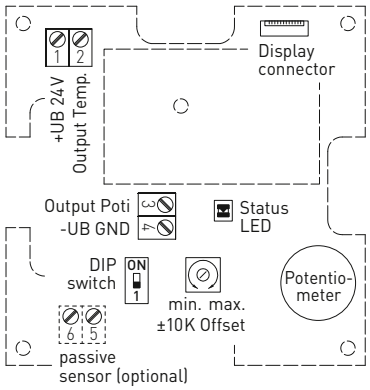
NEW

Room temperature measuring transducers, calibratable, with display and / or potentiometer and active output (Automatic Output Switching)

Schematic diagram without potentiometer — **RTM xx**



Schematic diagram **with potentiometer** — **RTM xx P**



RTM xx
with Potentiometer, with/without display



SI IMP

2-wire* without potentiometer, with display — **RTM-I LCD**

1 +UB 24V DC
2 Output Temp. 4...20mA

3 free
4 –UB GND (optional for backlighting)

* 2-wire connection for devices with display (not illuminated)
3-wire connection for devices with illuminated display

4-wire (AOS) **with potentiometer**, with/without display — **RTM-A P** **RTM-A P LCD**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA

3 Output Poti 0-10V / 4...20mA
4 –UB GND

3-wire (AOS) without potentiometer, with display — **RTM-A LCD**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA

3 free
4 –UB GND

6-wire (AOS) **with potentiometer,** with passive sensor — **RTM-A P Pt1000**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA

3 Output Poti 0-10V / 4...20mA
4 –UB GND

5
6 Rx passive sensor (optional)



Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® RTM xx — Room temperature measuring transducers (with display and/or potentiometer)

Type / WG01	Output Temperature active	Output Temperature passive	Output Potentiometer active	Poti	Display	Item No.	Price
RTM-I	**(2-wire)**						
RTM-I **LCD**	4...20 mA	(optional)	–		■	1101-41A2-2000-200	**124,43 €**
RTM-A	**(AOS)**						
RTM-A **LCD**	0-10 V / 4...20 mA	(optional)	–		■	1101-41AE-2000-200	**124,43 €**
RTM-A **P LCD**	0-10 V / 4...20 mA	(optional)	0-10 V / 4...20 mA	●	■	1101-41AE-2004-346	**256,09 €**
RTM-A **P**	0-10 V / 4...20 mA	(optional)	0-10 V / 4...20 mA	●		1101-41AE-0004-346	**151,19 €**
RTM-A **P Pt1000**	0-10 V / 4...20 mA	**Pt1000**	0-10 V / 4...20 mA	●		1101-41AE-0054-346	**158,54 €**
Automatic Output Switching:	patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.						
Measuring range:	**0...+ 50 °C** (permanently set)						
Extra charge:	other measuring ranges optional additional passive sensor (pin 5/6) optionally upon request						**26,16 €**
Potentiometer:	the standard **marking** is a swelling arrow with centre position, (– • +), unfilled optionally wedge-shaped without centre position (–...+) or with marking points (–3K ...+3K) – special print upon request						

THERMASGARD® FSTM
THERMASGARD® FSTM-P

**Room temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

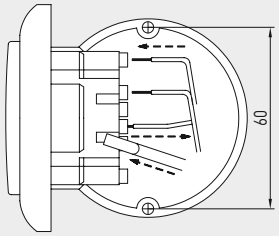
S+S REGELTECHNIK

The room sensor **THERM**ASGARD® **FSTM / FSTM - P** in the in-wall housing, optionally with potentiometer, is used for measuring the room temperature, and for setpoint adjustment. It converts the measured values into a standard signal of 0 -10 V. A digital, long-term stable sensor is used for temperature measurement.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

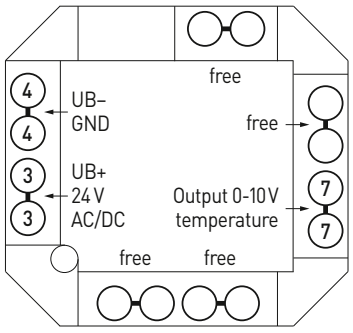
Mounting diagram [mm] **in-wall**



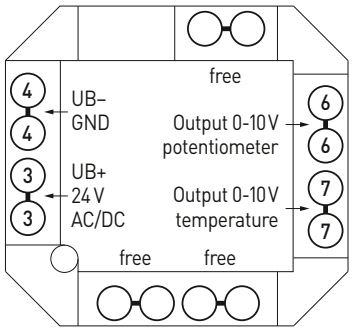
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC
TEMPERATURE	
Sensor:	**digital temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0 - 10 V
POTENTIOMETER	
Output, potentiometer:	0 - 10 V (**FSTM-P** with setpoint adjustment, not possible with Busch-Jaeger
GENERAL	
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1,0 - 2,5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSTM**

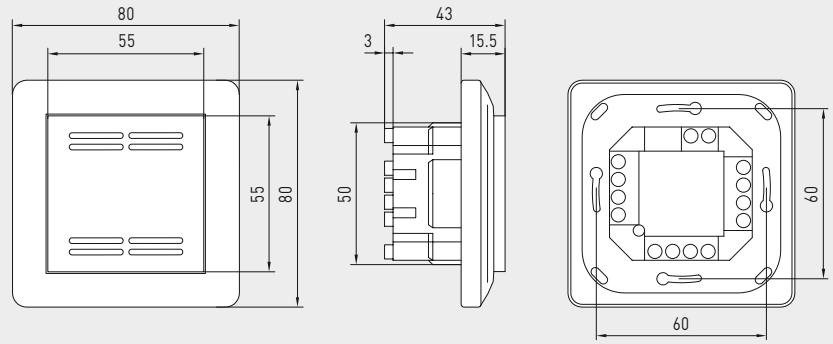


Connection diagram **FSTM - P**



Dimensional drawing
[mm]

FSTM

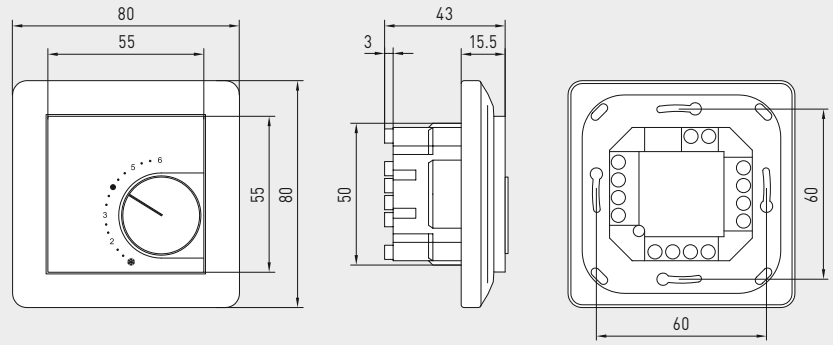


FSTM
Standard



Dimensional drawing
[mm]

FSTM-P



FSTM-P
with potentiometer



Temperature table
MR: 0...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

THERMASGARD® FSTM Room temperature sensor or measuring transducer, in-wall
THERMASGARD® FSTM-P Room temperature sensor or measuring transducer, in-wall with potentiometer

Type / WG02	Measuring Range Temperature	Output Temperature	Potentiometer	Item No.	Price
FSTM					
FSTM-U	0...+50 °C	0-10 V	–	1101-9121-0000-162	**129,44 €**
FSTM-P					
FSTM-U P	0...+50 °C	0-10 V	0-10 V	1101-9121-0004-282	**153,86 €**

THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable outside temperature measuring transducer **THERM**ASGARD® **ATM 2**, with eight switchable measuring ranges (max. –20...+150 °C), active output, external sensor, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with / without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend the use of our sun and ball-impact protection hood **WS01** or **WS04** (accessories) or the device version with the installed sun protection **SS02** (on request).
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ATM 2
with sun protection SS02 (on request)



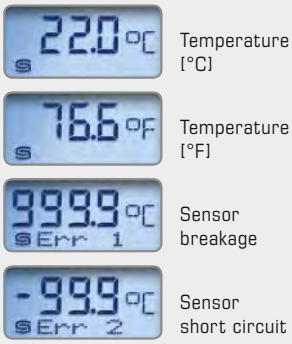
ATM 2 - Q
with M12 connector



TECHNICAL DATA

ATM 2 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
ATM 2 - A (**AOS**)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **with manual zero point correction** (**± 10 K**)
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Protective tube:	made from stainless steel **V4A** (1.4571), Ø 6 mm, NL = 65 mm
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	by means of screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

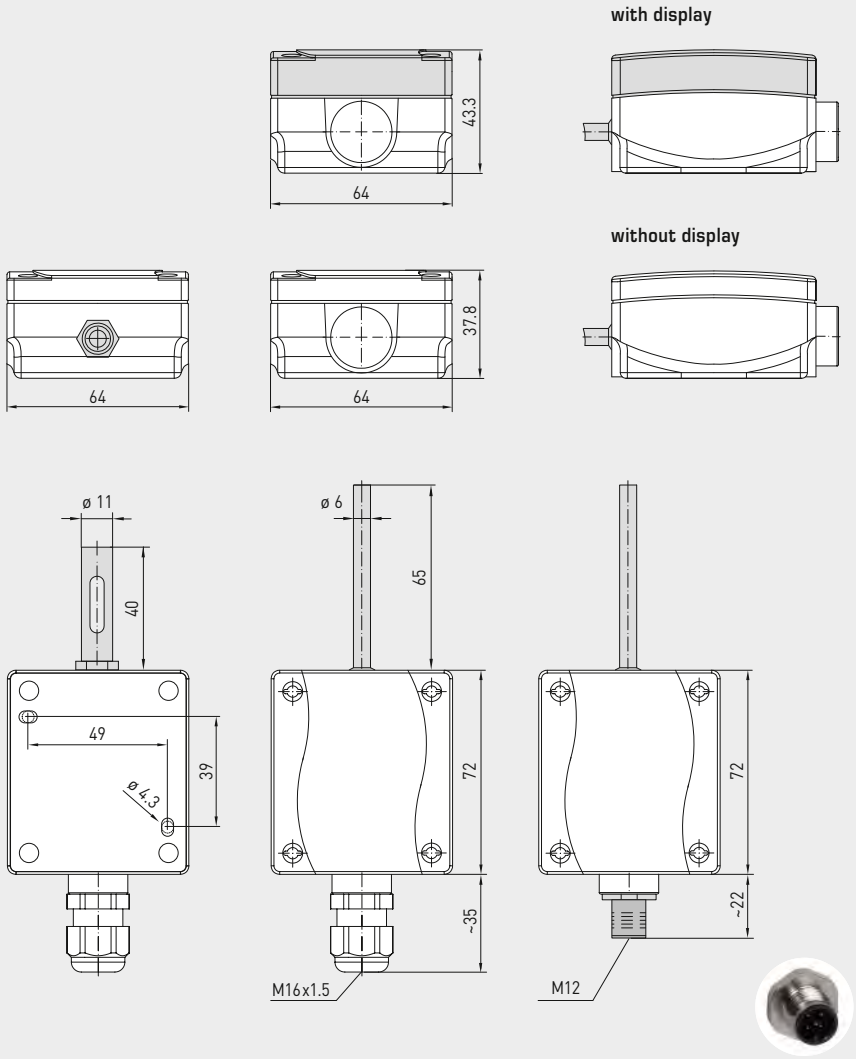
Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

Dimensional drawing
[mm]

ATM 2



Housing with
SS-02 (on request)

Housing with
cable gland

Housing with
M12 connector

ATM 2
with cable gland
and display



ATM 2 - Q
with M12 connector
and display





High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

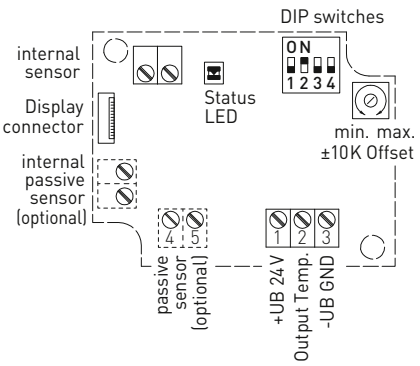
THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **ATM 2 xx**



2-wire connection* **ATM 2 - I**

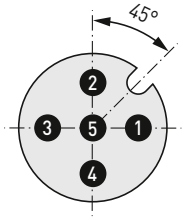
1 +UB 24V DC
2 Output Temp. 4...20mA
3 –UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) **ATM 2 - A**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA
3 –UB GND

Pin assignment (M12) **ATM 2 xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

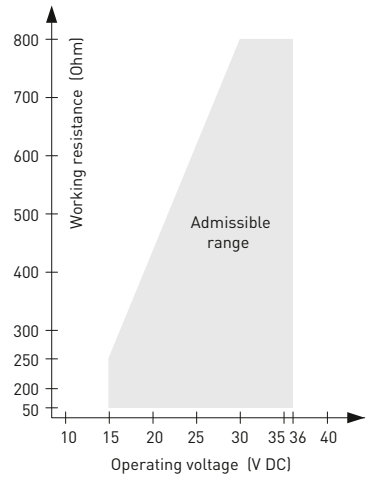
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

Load resistance diagram (2-wire) **ATM 2 - I**



For further technical information, see the operating instructions

Accessories **WS-01**



Accessories **WS-04**



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

ATM 2 - Q
with M12 connector





ATM 2
with cable gland

THERMASGARD® ATM 2	Outside temperature / wet room temperature measuring transducers (with cable gland)			
Type / WG01	**Output**	**Display**	**Item No.**	**Price**
ATM 2 - I	**(2-wire)**			
ATM2-I	4...20 mA		1101-1142-0009-900	**103,55 €**
ATM2-I LCD	4...20 mA	■	1101-1142-2009-900	**155,98 €**
ATM 2 - A	**(3-wire AOS)**			
ATM2-A	0-10 V / 4...20 mA		1101-114E-0009-900	**103,55 €**
ATM2-A LCD	0-10 V / 4...20 mA	■	1101-114E-2009-900	**155,98 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant:	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional with sun protection **SS02**		on request	**26,16 €** **10,03 €**

THERMASGARD® ATM 2-Q	Outside temperature / wet room temperature measuring transducers (with M12 connector)			
Type / WG01	**Output**	**Q / Display**	**Item No.**	**Price**
ATM 2 - I Q	**(2-wire)**			
ATM2-I Q	4...20 mA	●	2001-6111-2100-001	**146,71 €**
ATM2-I Q LCD	4...20 mA	● ■	2001-6112-2100-001	**199,17 €**
ATM 2 - A Q	**(3-wire AOS)**			
ATM2-A Q	0-10 V / 4...20 mA	●	2001-6111-B100-001	**146,71 €**
ATM2-A Q LCD	0-10 V / 4...20 mA	● ■	2001-6112-B100-001	**199,17 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)			
Extra charge:	other measuring ranges optional with sun protection **SS02**		on request	**26,16 €** **10,03 €**

ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	Special accessories for M12 connector see chapter Accessories !		

THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable outside temperature measuring transducer **THERM**ASGARD® **ATM 2 - VA**, with eight switchable measuring ranges (max. –20...+150 °C), active output, external sensor, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS03** (accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

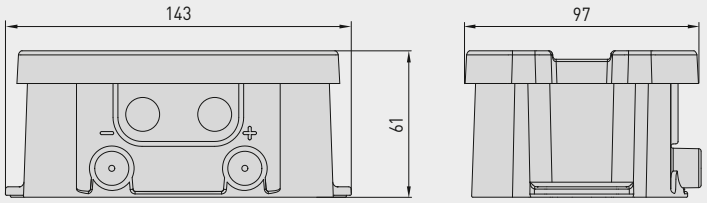
TECHNICAL DATA

ATM 2 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
ATM 2 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Protective tube:	made from stainless steel **V4A** (1.4571), Ø 6 mm, NL = 65 mm
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr 2E)
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	by means of screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)

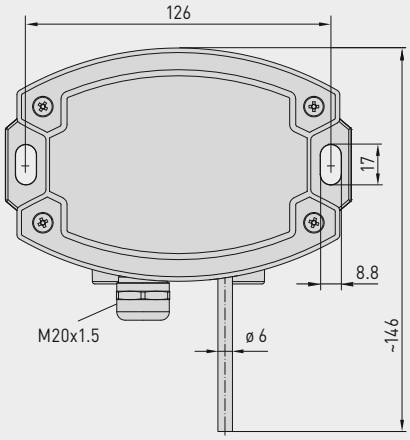
Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

Dimensional drawing
[mm]

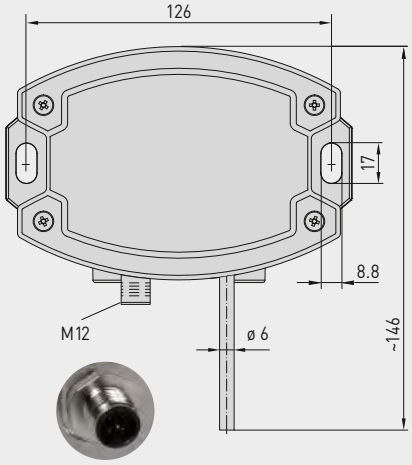
ATM 2 - VA



Housing with
cable gland



Housing with
M12 connector



ATM 2 - VA
with cable gland



ATM 2 - VAQ
with M12 connector



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

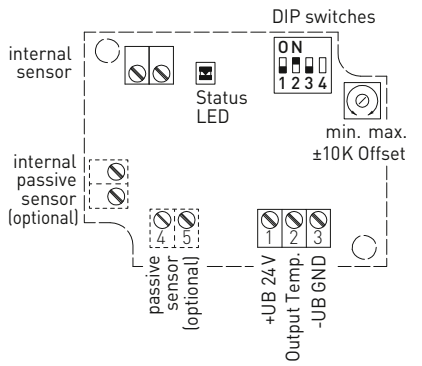
THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram without display **ATM 2 xx**



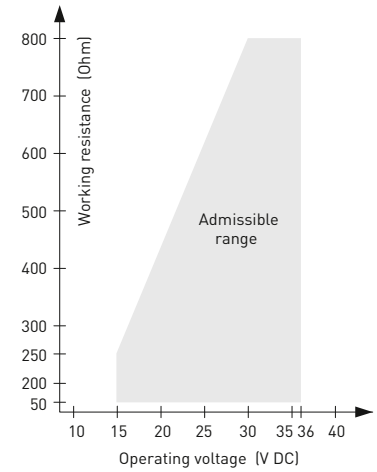
2-wire connection without display **ATM 2 - I**

1	+UB 24V DC
2	Output Temp. 4...20mA
3	free

3-wire connection (AOS) without display **ATM 2 - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	-UB GND

Load resistance diagram (2-wire) **ATM 2 - I**

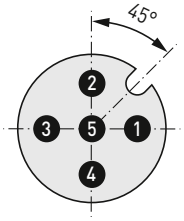


Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
−20...+150 °C	**ON**	**ON**	**ON**
−50... +50 °C	OFF	**ON**	**ON**
−20... +80 °C	**ON**	OFF	**ON**
−30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

DIP4 has no function!

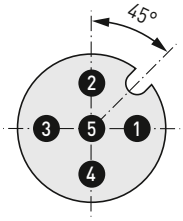
For further technical information, see the operating instructions

Pin assignment (M12) **ATM 2 - A VAQ**



1	+UB 24V AC/DC
2	Output Temperature 0-10V / 4...20mA
3	free
4	-UB GND
5	Shield

Pin assignment (M12) **ATM 2 - I VAQ**

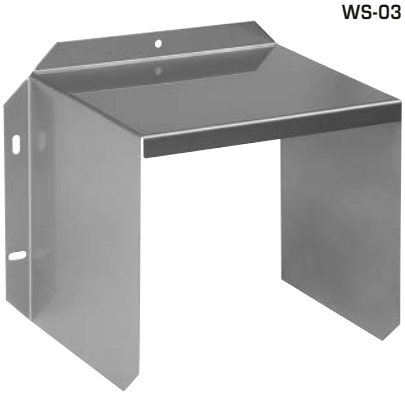


1	+UB 24V DC
2	Output Temperature 4...20mA
3	free
4	free
5	Shield

Accessories **WS-01**



Accessories **WS-03**



Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

ATM 2 - VAQ
with M12 connector



ATM 2 - VA
with cable gland



THERMASGARD® **ATM 2 - VA**	Outside temperature / wet room temperature measuring transducers, *ID* (Stainless steel housing **with cable gland**)		
Type / WG02I	**Output**	**Item No.**	**Price**
ATM 2 - I VA	**(2-wire)**		
ATM2-I VA	4...20 mA	2001-6171-2200-001	**388,67 €**
ATM 2 - A VA	**(3-wire AOS)**		
ATM2-A VA	0-10 V / 4...20 mA	2001-6171-B200-001	**388,67 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
Housing variant:	Cable connection **with cable gland**		
Extra charge:	other measuring ranges optional		**26,16 €**

THERMASGARD® **ATM 2 - VAQ**	Outside temperature / wet room temperature measuring transducers, *ID* (Stainless steel housing **with M12 connector**)			
Type / WG02I	**Output**	**● = Q**	**Item No.**	**Price**
ATM 2 - I VAQ	**(2-wire)**			
ATM2-I VA**Q**	4...20 mA	●	2001-6171-2100-001	**428,36 €**
ATM 2 - A VAQ	**(3-wire AOS)**			
ATM2-A VAQ	0-10 V / 4...20 mA	●	2001-6171-B100-001	**428,36 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)			
Extra charge:	other measuring ranges optional			**26,16 €**

ACCESSORIES			
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	Special accessories for M12 connector see chapter Accessories !		

THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2012 017 500.0 and DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer **THERM**ASGARD® **TM 43**, with eight switchable measuring ranges (max. –20...+150 °C), active output, straight protective tube, housing made from impact-resistant plastic with snap-on lid (IP 54), optionally with or without display. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. Available as a U variant (3-wire) or I variant (2-wire).

Calibratable temperature measuring transducer **THERM**ASGARD® **TM 65**, with eight switchable measuring ranges (max. –20...+150 °C), active output, straight protective tube, housing made from impact-resistant plastic with with quick-locking screws (IP 67), optionally with or without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used. It is used e.g. in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot-water and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 43
with snap-on lid
(IP 54)



TM 65
with quick-locking screws
(IP 67)



TECHNICAL DATA

TM xx - U	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L > 15 kOhm with U variant (**TM43**)
Connection type:	3-wire connection
Output:	**0-10 V**
TM xx - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
TM xx - A (**AOS**)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with **AOS** I variant R_L > 15 kOhm with **AOS** U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **imperial** (**TM 65** can be changed via DIP switch)
Data points:	temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Protective tube:	stainless steel, **V4A** (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! **TM 43 with snap-on lid** **TM 65 with quick-locking screws** (slotted / Phillips head combination)
Housing dimension:	72 x 64 x 37.8 mm (Typ 1 without display) 72 x 64 x 43.3 mm (Typ 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**TM 43 IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Typ 01) **TM 65 IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Typ 1) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Temperature [°C]



Temperature [°F]



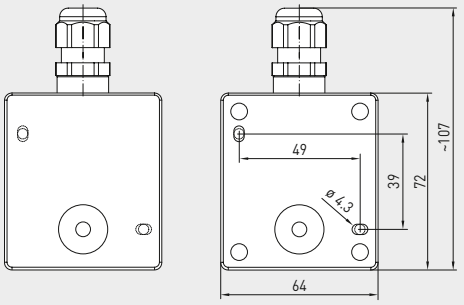
Sensor breakage

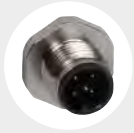


Sensor short circuit

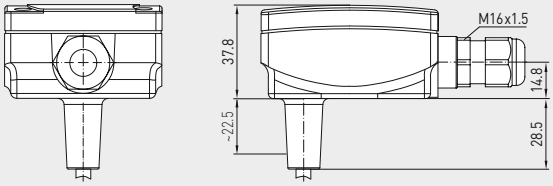
Dimensional drawing
[mm]

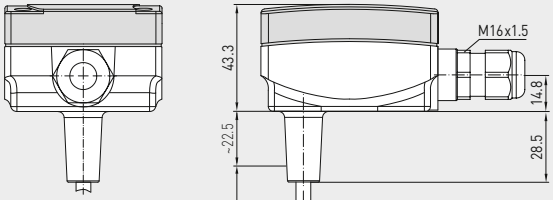
TM 43
TM 65

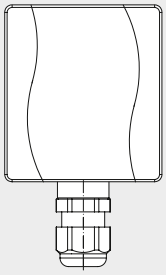




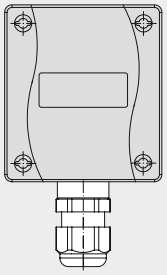
M12 connector
(optional on request)







with snap-on lid



with quick-locking screws

TM 43
with display and
snap-on lid
(IP 54)



TM 65
with display and
quick-locking screws
(IP 67)



SI IMP

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



TM 65
Basic device
with accessories

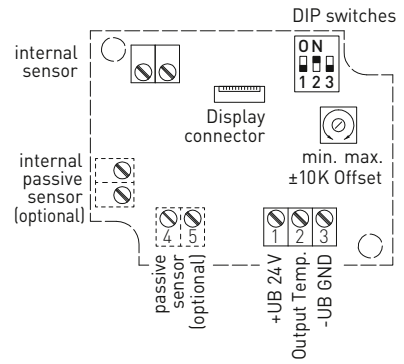
THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **TM 43**



3-wire connection **TM xx - U**

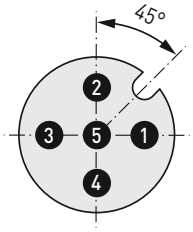
1 +UB 24V AC/DC
2 Output Temp. 0-10V
3 –UB GND

2-wire connection* **TM xx - I**

1 +UB 24V DC
2 Output Temp. 4...20mA
3 –UB GND (optional for backlighting)

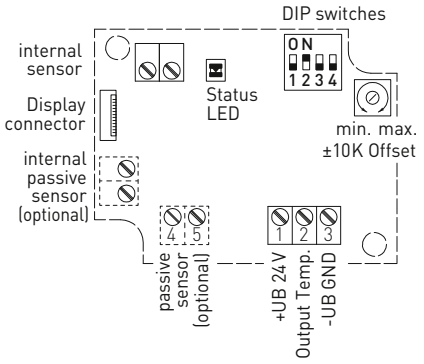
* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Pin assignment (M12) **TM xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

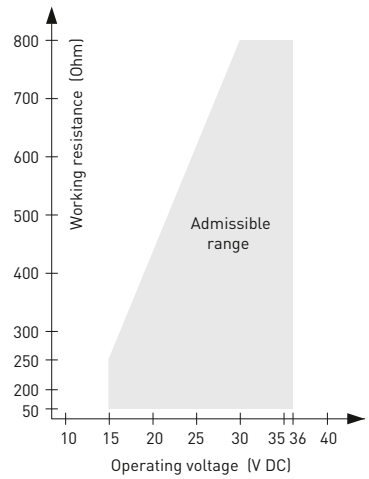
Schematic diagram **TM 65**



3-wire connection (AOS) **TM xx - A**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA
3 –UB GND

Load resistance diagram (2-wire) **TM xx - I**



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

TM 65
Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

SI IMP

For further technical information, see the operating instructions



TM 43
(IP 54)



TM 65
(IP 67)

SI IMP

THERMASGARD® TM 43	Temperature measuring transducer (basic device with snap-on lid), *Standard*				
Type / WG01B	**Output**	**Inserted Length (EL)**	**Display**	**Item No.**	**Price**
TM 43 - I	**(2-wire)**			**IP 54**	
TM43-I 50mm	4...20 mA	**50 mm**		1101-7112-0019-900	**74,46 €**
TM43-I 50mm **LCD**	4...20 mA	**50 mm**	■	1101-7112-2019-900	**142,81 €**
TM43-I 100mm	4...20 mA	**100 mm**		1101-7112-0029-900	**75,68 €**
TM43-I 100mm **LCD**	4...20 mA	**100 mm**	■	1101-7112-2029-900	**144,02 €**
TM43-I 150mm	4...20 mA	**150 mm**		1101-7112-0039-900	**76,79 €**
TM43-I 150mm **LCD**	4...20 mA	**150 mm**	■	1101-7112-2039-900	**145,14 €**
TM43-I 200mm	4...20 mA	**200 mm**		1101-7112-0049-900	**77,16 €**
TM43-I 200mm **LCD**	4...20 mA	**200 mm**	■	1101-7112-2049-900	**145,51 €**
TM43-I 250mm	4...20 mA	**250 mm**		1101-7112-0059-900	**78,44 €**
TM43-I 250mm **LCD**	4...20 mA	**250 mm**	■	1101-7112-2059-900	**147,58 €**
TM43-I 300mm	4...20 mA	**300 mm**		1101-7112-0069-900	**79,72 €**
TM43-I 300mm **LCD**	4...20 mA	**300 mm**	■	1101-7112-2069-900	**148,06 €**
TM 43 - U	**(3-wire)**			**IP 54**	
TM43-U 50mm	0-10 V	**50 mm**		1101-7111-0019-900	**74,46 €**
TM43-U 50mm **LCD**	0-10 V	**50 mm**	■	1101-7111-2019-900	**142,81 €**
TM43-U 100mm	0-10 V	**100 mm**		1101-7111-0029-900	**75,68 €**
TM43-U 100mm **LCD**	0-10 V	**100 mm**	■	1101-7111-2029-900	**144,02 €**
TM43-U 150mm	0-10 V	**150 mm**		1101-7111-0039-900	**76,79 €**
TM43-U 150mm **LCD**	0-10 V	**150 mm**	■	1101-7111-2039-900	**145,14 €**
TM43-U 200mm	0-10 V	**200 mm**		1101-7111-0049-900	**77,16 €**
TM43-U 200mm **LCD**	0-10 V	**200 mm**	■	1101-7111-2049-900	**145,51 €**
TM43-U 250mm	0-10 V	**250 mm**		1101-7111-0059-900	**78,44 €**
TM43-U 250mm **LCD**	0-10 V	**250 mm**	■	1101-7111-2059-900	**147,58 €**
TM43-U 300mm	0-10 V	**300 mm**		1101-7111-0069-900	**79,72 €**
TM43-U 300mm **LCD**	0-10 V	**300 mm**	■	1101-7111-2069-900	**148,06 €**

THERMASGARD® TM 65	Temperature measuring transducer (basic device with quick-locking screws), *Premium*				
Type / WG01	**Output**	**Inserted Length (EL)**	**Display**	**Item No.**	**Price**
TM 65 - I	**(2-wire)**			**IP 67**	
TM65-I 50mm	4...20 mA	**50 mm**		1101-7122-0019-900	**103,19 €**
TM65-I 50mm **LCD**	4...20 mA	**50 mm**	■	1101-7122-2019-900	**155,64 €**
TM65-I 100mm	4...20 mA	**100 mm**		1101-7122-0029-900	**103,47 €**
TM65-I 100mm **LCD**	4...20 mA	**100 mm**	■	1101-7122-2029-900	**155,91 €**
TM65-I 150mm	4...20 mA	**150 mm**		1101-7122-0039-900	**103,70 €**
TM65-I 150mm **LCD**	4...20 mA	**150 mm**	■	1101-7122-2039-900	**156,17 €**
TM65-I 200mm	4...20 mA	**200 mm**		1101-7122-0049-900	**103,92 €**
TM65-I 200mm **LCD**	4...20 mA	**200 mm**	■	1101-7122-2049-900	**156,37 €**
TM65-I 250mm	4...20 mA	**250 mm**		1101-7122-0059-900	**104,25 €**
TM65-I 250mm **LCD**	4...20 mA	**250 mm**	■	1101-7122-2059-900	**156,69 €**
TM65-I 300mm	4...20 mA	**300 mm**		1101-7122-0069-900	**105,03 €**
TM65-I 300mm **LCD**	4...20 mA	**300 mm**	■	1101-7122-2069-900	**157,46 €**
TM65-I 400mm	4...20 mA	**400 mm**		1101-7122-0089-900	**107,14 €**
TM65-I 400mm **LCD**	4...20 mA	**400 mm**	■	1101-7122-2089-900	**159,60 €**
TM 65 - A	* **(3-wire AOS)**			**IP 67**	
TM65-A 50mm	0-10 V / 4...20 mA	**50 mm**		1101-712E-0019-900	**103,19 €**
TM65-A 50mm **LCD**	0-10 V / 4...20 mA	**50 mm**	■	1101-712E-2019-900	**155,64 €**
TM65-A 100mm	0-10 V / 4...20 mA	**100 mm**		1101-712E-0029-900	**103,47 €**
TM65-A 100mm **LCD**	0-10 V / 4...20 mA	**100 mm**	■	1101-712E-2029-900	**155,91 €**
TM65-A 150mm	0-10 V / 4...20 mA	**150 mm**		1101-712E-0039-900	**103,70 €**
TM65-A 150mm **LCD**	0-10 V / 4...20 mA	**150 mm**	■	1101-712E-2039-900	**156,17 €**
TM65-A 200mm	0-10 V / 4...20 mA	**200 mm**		1101-712E-0049-900	**103,92 €**
TM65-A 200mm **LCD**	0-10 V / 4...20 mA	**200 mm**	■	1101-712E-2049-900	**156,37 €**
TM65-A 250mm	0-10 V / 4...20 mA	**250 mm**		1101-712E-0059-900	**104,25 €**
TM65-A 250mm **LCD**	0-10 V / 4...20 mA	**250 mm**	■	1101-712E-2059-900	**156,69 €**
TM65-A 300mm	0-10 V / 4...20 mA	**300 mm**		1101-712E-0069-900	**105,03 €**
TM65-A 300mm **LCD**	0-10 V / 4...20 mA	**300 mm**	■	1101-712E-2069-900	**157,46 €**
TM65-A 400mm	0-10 V / 4...20 mA	**400 mm**		1101-712E-0089-900	**107,14 €**
TM65-A 400mm **LCD**	0-10 V / 4...20 mA	**400 mm**	■	1101-712E-2089-900	**159,60 €**
Automatic Output Switching:	* patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

S+S REGELTECHNIK

One basic device in four variants ...



TM xx + TH 08-ms/xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated / galvanised



PATENTED
DE 10 2012 017 500.0

TM xx + TH 08-VA/xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM xx + TH 08-VA/xx/90

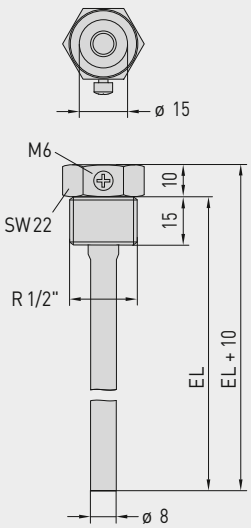
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



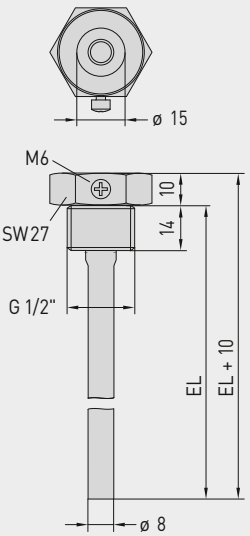
TM xx + MF-15-K

Duct temperature sensor with mounting flange, plastic

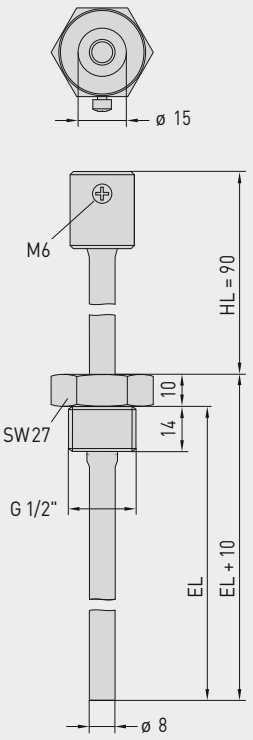
Dimensional drawing
TH 08-ms/xx
[mm]



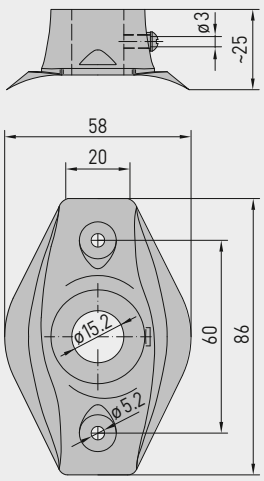
Dimensional drawing
TH 08-VA/xx
[mm]



Dimensional drawing
TH 08-VA/xx/90
[mm]



Dimensional drawing
MF-15-K
[mm]



... through combination with accessories:



TH 08-ms/xx

Immersion sleeve,
brass, nickel-plated / galvanised,
thread-sealing, conical,
according to DIN 10226



TH 08-VA/xx

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



TH 08-VA/xx/90

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228



MF-15-K

Mounting flange,
plastic

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH 08-ms/xx	**Brass nickel-plated / galvanised**			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**12,90 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**13,50 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**14,60 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**15,62 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**18,09 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**18,90 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**19,40 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**19,90 €**
TH 08-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**22,24 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**24,50 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**26,50 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**27,80 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**34,60 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**36,20 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**36,90 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**37,90 €**
TH 08-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,91 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**31,26 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**32,80 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**34,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**35,83 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**38,84 €**
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				

Mounting flange (Accessories)				
Type / WG01B		**T_{max}**	**Item No.**	**Price**
MF				
MF-15-K	**Mounting flange,** plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland	+100 °C	7100-0032-0000-000	**6,30 €**
Note:	For further information see last chapter!			

THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

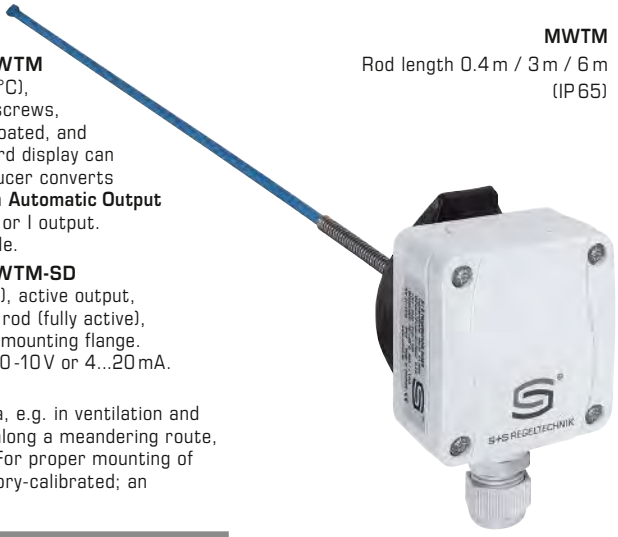
Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable mean-value temperature measuring transducer **THERM**ASGARD® **MWTM** (rod sensor 0.4...20 m), with eight switchable measuring ranges (max. –20...+150 °C), active output, housing made from impact-resistant plastic with with quick-locking screws, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange, optionally with or without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

Calibratable mean-value temperature measuring transducer **THERM**ASGARD® **MWTM-SD** (rod sensor 3 m / 6 m) with eight switchable measuring ranges (max. –20...+150 °C), active output, housing made from impact-resistant plastic with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. Available as a U variant (3-wire) or I variant (2-wire).

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

MWTM
Rod length 0.4 m / 3 m / 6 m
(IP 65)



TECHNICAL DATA

MWTM - U	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L > 15 kOhm with U variant (**MWTM-SD**)
Connection type:	3-wire connection
Output:	**0-10 V**
MWTM - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
MWTM - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with **AOS** I variant R_L > 15 kOhm with **AOS** U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **imperial** (**MWTM** can be changed via DIP switch)
Data points:	temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) T_{min} –30 °C, T_{max} +80 °C **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B
Deviation, temperature:	typically ± 0.2 K at +25 °C
Sensors:	active across the entire length (averaging)
Rod material:	**protective tube made from copper, plastic-coated** (**MWTM**) (made from reinforced thermoplastic hose for the **MWTM-SD**), with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optionally up to max. 20 m), see table
Rod laying:	**Observe the admissible values!** Bending radius: **> 35 mm** Vibration load: **≤ 0.5 g** Tensile load: **< 480 N** (**MWTM**) / **< 100 N** (**MWTM-SD**)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016) **MWTM-SD with snap-on lid** **MWTM with quick-locking screws** (slotted / Phillips head combination), housing cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Typ 1 without display) 72 x 64 x 43.3 mm (Typ 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws

Continued on next page!



MWTM-SD
Rod length 3 m / 6 m
(IP 54)



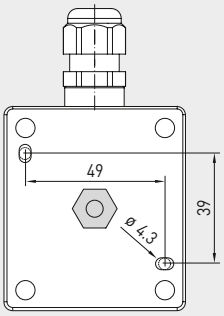
NEW

THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output (Automatic Output Switching)

Dimensional drawing [mm]

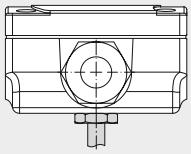
MWTM

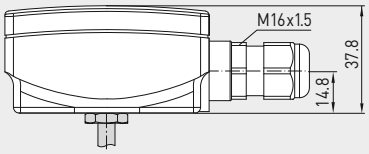




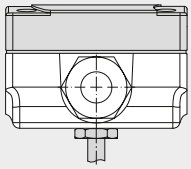
M12 connector
(optional on request)

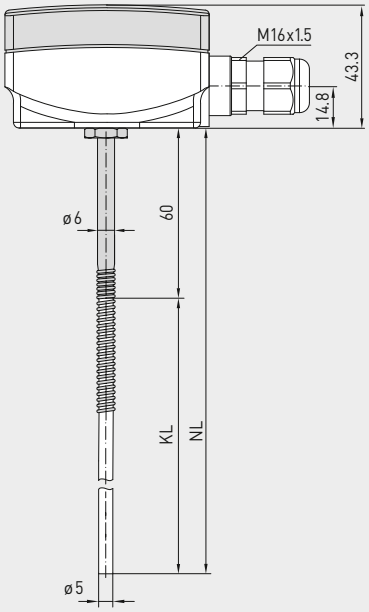
without display

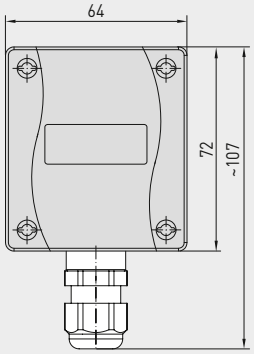




with display







MWTM
Rod length 0.4 m / 3 m / 6 m
with Display
(IP 65)





Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

TECHNICAL DATA (continued)

Process connection:	by mounting flange, plastic **MF-06-K** (included in the scope of delivery, galvanised steel optional) and mounting clamps **MK-05-M** (from 3 m rod length, included in the scope of delivery)
Ambient temperature:	measuring transducer –30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**MWTM-SD** **IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) **MWTM** **IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Temperature [°C]



Temperature [°F]



Sensor breakage



Sensor short circuit

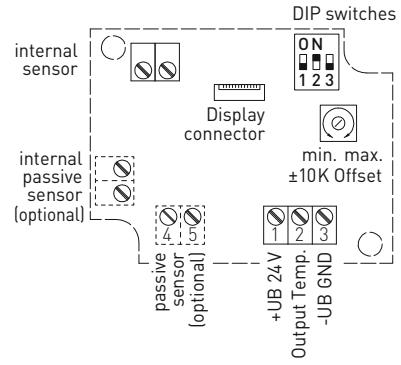
THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

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Schematic diagram **MWTM-SD**



3-wire connection **MWTM - U**

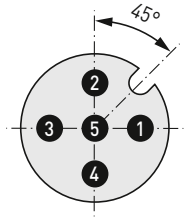
1 +UB 24V AC/DC
2 Output Temp. 0-10V
3 –UB GND

2-wire connection* **MWTM - I**

1 +UB 24V DC
2 Output Temp. 4...20mA
3 –UB GND (optional for backlighting)

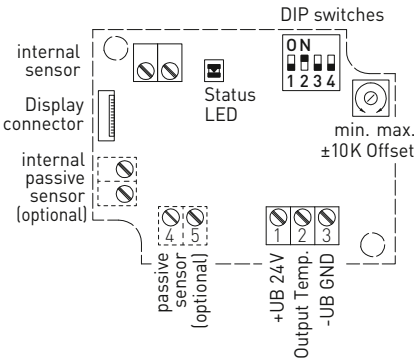
* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Pin assignment (M12) **MWTM**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

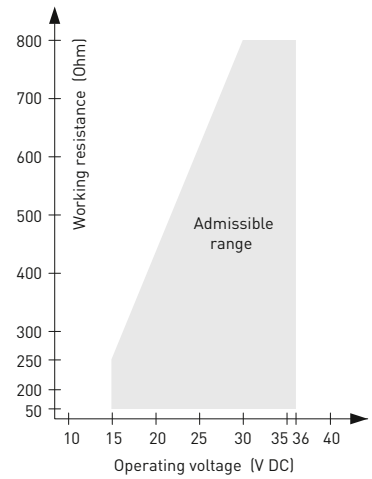
Schematic diagram **MWTM**



3-wire connection (AOS) **MWTM - A**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA
3 –UB GND

Load resistance diagram (2-wire) **MWTM - I**



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

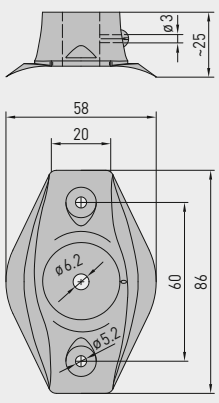
MWTM
Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

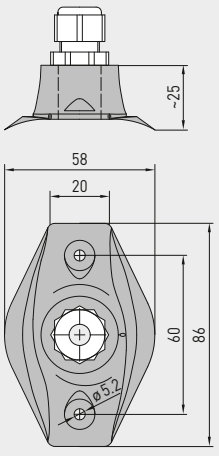
SI IMP

For further technical information, see the operating instructions

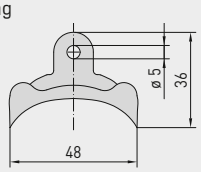
Dimensional drawing [mm] **MF-06-K**



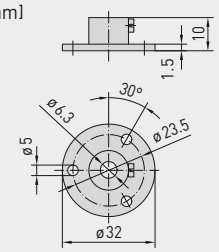
Dimensional drawing [mm] **KRD-04**



Dimensional drawing [mm] **MK-05-M**



Dimensional drawing [mm] **MF-06-M**



MF-06-K
Mounting flange, plastic
(Included in the scope of delivery)



KRD-04
Capillary tube bushing, plastic
(optional)



MK-05-M
Mounting clamps, galvanised steel
(from 3 m rod length, included in the scope of delivery)



MF-06-M
Mounting flange, metal
(optional)



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NEW

THERMASGARD® MWTM
THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output (Automatic Output Switching)

MWTM-SD
(IP 54)



MWTM
(IP 65)



THERMASGARD® MWTM-SD	Mean-value temperature measuring transducer with rod made from reinforced **thermoplastic hose** (black), *Standard*				
Type / WG01B	**Output**	**Rod length**	(without display)	**Item No.**	**Price**
MWTM-SD-I	**(2-wire)**			**IP 54**	
MWTM-SD-I 3m	4...20 mA	3.0 m		1101-3132-0239-90K	**165,27 €**
MWTM-SD-I 6m	4...20 mA	6.0 m		1101-3132-0269-90K	**175,50 €**
MWTM-SD-U	**(3-wire)**			**IP 54**	
MWTM-SD-U 3m	0-10 V	3.0 m		1101-3131-0239-90K	**165,27 €**
MWTM-SD-U 6m	0-10 V	6.0 m		1101-3131-0269-90K	**175,50 €**

THERMASGARD® MWTM	Mean-value temperature measuring transducer with rod made from **copper, plastic-coated** (blue), *Premium*				
Type / WG01	**Output**	**Rod length**	**Display**	**Item No.**	**Price**
MWTM-I	**(2-wire)**			**IP 65**	
MWTM-I 0,4m	4...20 mA	0.4 m		1101-3132-0089-900	**176,49 €**
MWTM-I 0,4m **LCD**	4...20 mA	0.4 m	■	1101-3132-1089-900	**227,79 €**
MWTM-I 3m	4...20 mA	3.0 m		1101-3132-0239-900	**229,47 €**
MWTM-I 3m **LCD**	4...20 mA	3.0 m	■	1101-3132-1239-900	**280,78 €**
MWTM-I 6m	4...20 mA	6.0 m		1101-3132-0269-900	**280,57 €**
MWTM-I 6m **LCD**	4...20 mA	6.0 m	■	1101-3132-2269-900	**329,75 €**
MWTM-A	**(3-wire AOS)**			**IP 65**	
MWTM-A 0,4m	0-10 V / 4...20 mA	0.4 m		1101-313E-0089-900	**176,49 €**
MWTM-A 0,4m **LCD**	0-10 V / 4...20 mA	0.4 m	■	1101-313E-1089-900	**227,79 €**
MWTM-A 3m	0-10 V / 4...20 mA	3.0 m		1101-313E-0239-900	**229,47 €**
MWTM-A 3m **LCD**	0-10 V / 4...20 mA	3.0 m	■	1101-313E-2239-900	**280,78 €**
MWTM-A 6m	0-10 V / 4...20 mA	6.0 m		1101-313E-0269-900	**280,57 €**
MWTM-A 6m **LCD**	0-10 V / 4...20 mA	6.0 m	■	1101-313E-1269-900	**329,75 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	other ranges optional per meter sensor cable (from 6 m to max. 20 m)			on request	**26,16 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

ACCESSORIES			
MF-06-K	**Mounting flange,** plastic (included in the scope of delivery)	7100-0030-1000-000	**6,30 €**
MF-06-M	**Mounting flange,** metal (Galvanised steel), Ø 35 mm	7100-0030-5000-100	**12,95 €**
KRD-04	**Capillary tube gland bracket,** plastic	7100-0030-7000-000	**9,18 €**
MK-05-M	**Mounting clamps**, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	**10,18 €**
	For further information see chapter Accessories!		

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable temperature measuring transducer **THERM**ASGARD® **TM 54** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TM 54
Basic unit

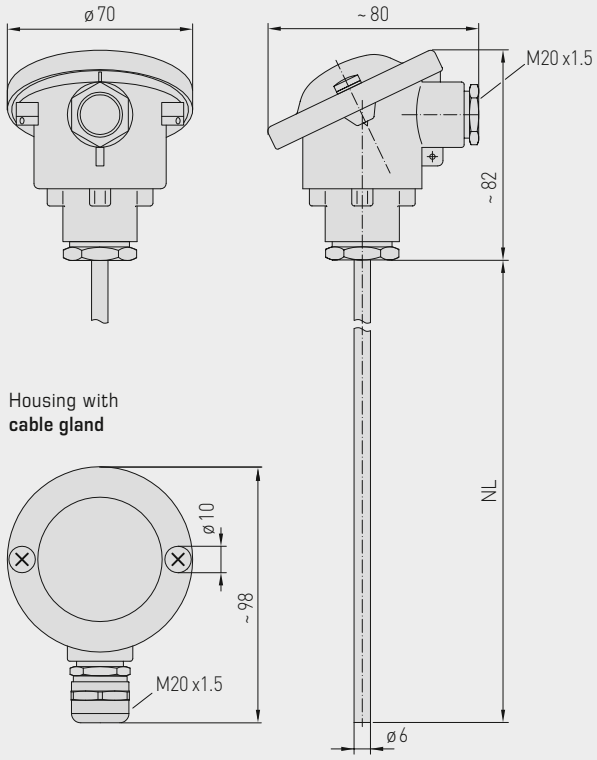


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000, DIN EN 60571, class B (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) T_{max} = +150°C **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**TM 54** (standard) adjusting screw made of metal (M 20 x 1.5) **TM 54-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **TM 54-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –30...+70 °C
Protective tube:	stainless steel, V4A (1.4571) Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **TM 54** **IP 65** (according to EN 60 529) **TM 54-KV / TM 54-Q**
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)
TH-ms / xx	**Immersion sleeve, brass, nickel-plated / galvanised** Ø = 8 mm, T_{max} = +150 °C, p_{max} = 10 bar
TH-VA / xx	**Immersion sleeve, stainless steel, V4A** (1.4571), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
TH-VA / xx / 90	**Immersion sleeve, stainless steel, V4A** (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{max} = +600 °C, p_{max} = 40 bar
MF-06-M	**Mounting flange,** metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, T_{max} = +700 °C

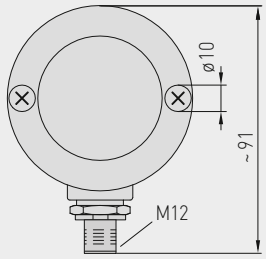
Dimensional drawing [mm]

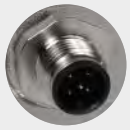
TM 54



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

TM 54
standard
(IP 54)



TM 54 - KV
with cable gland
(IP 65)



TM 54 - Q
with M12 connector
(IP 65)

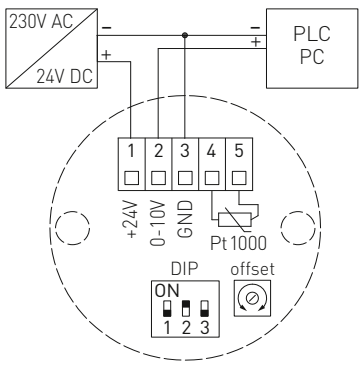




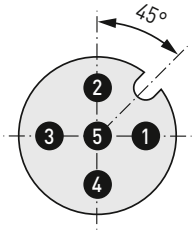
Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Connecting diagram **TM 54-U**



Pin assignment (M12) **TM 54-U**

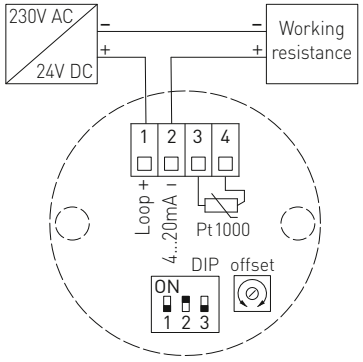


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

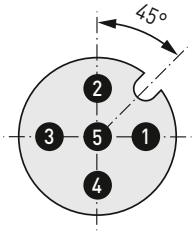
TM 54-U
Connecting head



Connecting diagram **TM 54-I**



Pin assignment (M12) **TM 54-I**



1. +UB 15...36 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND
5. Shield

TM 54-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

TM 54
standard
(IP 54)



THERMASGARD® **TM 54**	Temperature measuring transducer (Basic unit)			
Type / WG01	**Output**	**Installation length (EL)**	**Item No.**	**Price**
TM 54 - I			**IP 54**, I - variant	
TM54-I 50mm	4...20 mA	**50 mm**	1101-7152-0019-910	**156,43 €**
TM54-I 100mm	4...20 mA	**100 mm**	1101-7152-0029-910	**160,11 €**
TM54-I 150mm	4...20 mA	**150 mm**	1101-7152-0039-910	**167,32 €**
TM54-I 200mm	4...20 mA	**200 mm**	1101-7152-0049-910	**169,61 €**
TM54-I 250mm	4...20 mA	**250 mm**	1101-7152-0059-910	**171,71 €**
TM54-I 300mm	4...20 mA	**300 mm**	1101-7152-0069-910	**173,47 €**
TM54-I 350mm	4...20 mA	**350 mm**	1101-7152-0079-910	**177,01 €**
TM54-I 400mm	4...20 mA	**400 mm**	1101-7152-0089-910	**186,87 €**
TM 54 - U			**IP 54**, U - variant	
TM54-U 50mm	0 - 10 V	**50 mm**	1101-7151-0019-910	**156,43 €**
TM54-U 100mm	0 - 10 V	**100 mm**	1101-7151-0029-910	**160,11 €**
TM54-U 150mm	0 - 10 V	**150 mm**	1101-7151-0039-910	**167,32 €**
TM54-U 200mm	0 - 10 V	**200 mm**	1101-7151-0049-910	**169,61 €**
TM54-U 250mm	0 - 10 V	**250 mm**	1101-7151-0059-910	**171,71 €**
TM54-U 300mm	0 - 10 V	**300 mm**	1101-7151-0069-910	**173,47 €**
TM54-U 350mm	0 - 10 V	**350 mm**	1101-7151-0079-910	**177,02 €**
TM54-U 400mm	0 - 10 V	**400 mm**	1101-7151-0089-910	**186,87 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional			**26,16 €**

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

TM 54 - Q
with M12 connector
(IP 65)



THERMASGARD® **TM 54 - Q**	Temperature measuring transducer (Basic unit **with M12 connector**)				
Type / WG01	**Output**	**Installation length (EL)**	**Q**	**Item No.**	**Price**
TM 54 - I xx Q				**IP 65**, I - variant	
TM54-I 50mm **Q**	4...20 mA	**50 mm**	●	2001-4111-2100-011	**199,61 €**
TM54-I 100mm **Q**	4...20 mA	**100 mm**	●	2001-4111-2100-021	**203,28 €**
TM54-I 150mm **Q**	4...20 mA	**150 mm**	●	2001-4111-2100-031	**210,49 €**
TM54-I 200mm **Q**	4...20 mA	**200 mm**	●	2001-4111-2100-041	**212,79 €**
TM54-I 250mm **Q**	4...20 mA	**250 mm**	●	2001-4111-2100-051	**214,90 €**
TM54-I 300mm **Q**	4...20 mA	**300 mm**	●	2001-4111-2100-061	**216,67 €**
TM54-I 350mm **Q**	4...20 mA	**350 mm**	●	2001-4111-2100-071	**220,20 €**
TM54-I 400mm **Q**	4...20 mA	**400 mm**	●	2001-4111-2100-081	**230,05 €**
TM 54 - U xx Q				**IP 65**, U - variant	
TM54-U 50mm **Q**	0 - 10 V	**50 mm**	●	2001-4111-1100-011	**199,61 €**
TM54-U 100mm **Q**	0 - 10 V	**100 mm**	●	2001-4111-1100-021	**203,28 €**
TM54-U 150mm **Q**	0 - 10 V	**150 mm**	●	2001-4111-1100-031	**210,49 €**
TM54-U 200mm **Q**	0 - 10 V	**200 mm**	●	2001-4111-1100-041	**212,79 €**
TM54-U 250mm **Q**	0 - 10 V	**250 mm**	●	2001-4111-1100-051	**214,90 €**
TM54-U 300mm **Q**	0 - 10 V	**300 mm**	●	2001-4111-1100-061	**216,67 €**
TM54-U 350mm **Q**	0 - 10 V	**350 mm**	●	2001-4111-1100-071	**220,20 €**
TM54-U 400mm **Q**	0 - 10 V	**400 mm**	●	2001-4111-1100-081	**230,05 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional				**26,16 €**

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

TM 54 - KV
with cable gland
(IP 65)



THERMASGARD® **TM 54 - KV**	Temperature measuring transducer (Basic unit **with cable gland**)			
Type / WG01	**Output**	**Installation length (EL)**	**Item No.**	**Price**
TM 54 - I xx KV			**IP 65**, I - variant	
TM54-I 50mm **KV**	4...20 mA	**50 mm**	1101-7172-0019-910	**166,15 €**
TM54-I 100mm **KV**	4...20 mA	**100 mm**	1101-7172-0029-910	**169,83 €**
TM54-I 150mm **KV**	4...20 mA	**150 mm**	1101-7172-0039-910	**177,02 €**
TM54-I 200mm **KV**	4...20 mA	**200 mm**	1101-7172-0049-910	**179,32 €**
TM54-I 250mm **KV**	4...20 mA	**250 mm**	1101-7172-0059-910	**181,43 €**
TM54-I 300mm **KV**	4...20 mA	**300 mm**	1101-7172-0069-910	**183,21 €**
TM54-I 350mm **KV**	4...20 mA	**350 mm**	1101-7172-0079-910	**186,73 €**
TM54-I 400mm **KV**	4...20 mA	**400 mm**	1101-7172-0089-910	**196,58 €**
TM 54 - U xx KV			**IP 65**, U - variant	
TM54-U 50mm **KV**	0 - 10 V	**50 mm**	1101-7171-0019-910	**166,15 €**
TM54-U 100mm **KV**	0 - 10 V	**100 mm**	1101-7171-0029-910	**169,83 €**
TM54-U 150mm **KV**	0 - 10 V	**150 mm**	1101-7171-0039-910	**177,02 €**
TM54-U 200mm **KV**	0 - 10 V	**200 mm**	1101-7171-0049-910	**179,32 €**
TM54-U 250mm **KV**	0 - 10 V	**250 mm**	1101-7171-0059-910	**181,43 €**
TM54-U 300mm **KV**	0 - 10 V	**300 mm**	1101-7171-0069-910	**183,21 €**
TM54-U 350mm **KV**	0 - 10 V	**350 mm**	1101-7171-0079-910	**186,73 €**
TM54-U 400mm **KV**	0 - 10 V	**400 mm**	1101-7171-0089-910	**196,58 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional			**26,16 €**

Immersion / screw-in / duct temperature measuring transducer, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

One basic device in four variants ...



TM 54 +
TH - ms / xx

Immersion / screw-in temperature sensor with immersion sleeve, brass, nickel-plated / galvanised



TM 54 +
TH - VA / xx

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A



TM 54 +
TH - VA / xx / 90

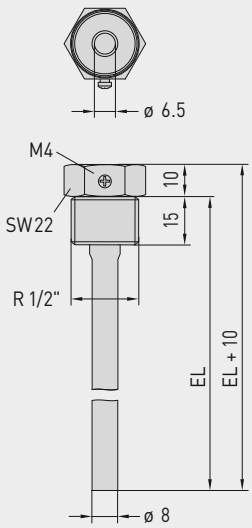
Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A



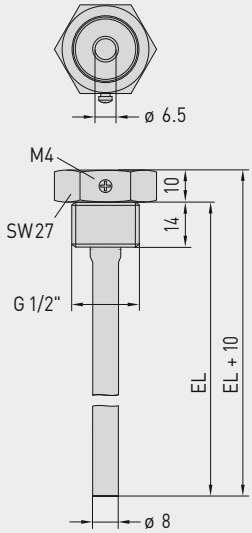
TM 54 +
MF - 06 - M

Duct temperature sensor with mounting flange, metal

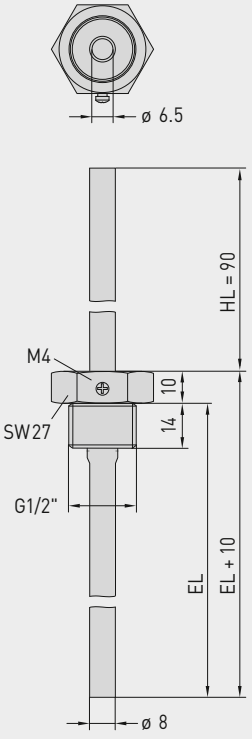
Dimensional drawing
TH - ms / xx



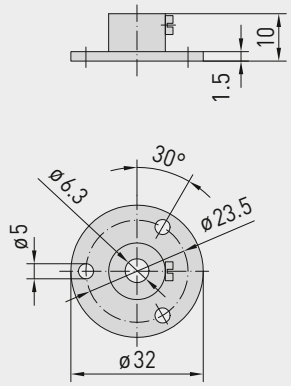
Dimensional drawing
TH - VA / xx



Dimensional drawing
TH - VA / xx / 90



Dimensional drawing
MF - 06 - M



...through combination with accessories:



TH-ms/xx

Immersion sleeve, brass, nickel-plated / galvanised, thread-sealing, conical, according to DIN 10226



TH-VA/xx

Immersion sleeve, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube, stainless steel, V4A, flat-sealing, cylindrical, according to DIN 228



MF-06-M

Mounting flange, metal

THERMASGARD® TH	Immersion sleeve Ø 8 mm (accessories)				
Type / WG01	**p_{max} (static)**	**T_{max}**	**Inserted Length (EL)**	**Item No.**	**Price**
TH-ms/xx	**Brass nickel-plated / galvanised**			without neck tube	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,59 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,93 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,54 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,91 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,79 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**14,17 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**14,29 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,42 €**
TH-VA/xx	**Stainless steel, V4A** (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,89 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**23,08 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,80 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**26,14 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**32,50 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**33,96 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**34,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**34,79 €**
TH-VA/xx/90	**Stainless steel, V4A** (1.4571)			**with neck tube** (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,91 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**31,26 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**32,80 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**34,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**35,83 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**38,84 €**
Note:	inner diameter of socket 6.5 mm For further information see last chapter!				

Mounting flange (accessories)				
Type / WG01		**T_{max}**	**Item No.**	**Price**
MF				
MF-06-M	**Mounting flange,** metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-100	**12,95 €**
Note:	For further information see last chapter!			

THERMASGARD® RGTM 1

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable smoke gas temperature measuring transducer **THERM**ASGARD® **RGTM 1** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube, incl. mounting flange.

The duct sensor is used to detect high temperatures in gaseous media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	10 kOhm (load max. 1 mA) for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60751, class B) (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**RGTM 1** (Standard) adjusting screw made of metal (M 20 x 1.5); **RGTM 1-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTM 1-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –30...+70 °C
Protective tube:	stainless steel, V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 400 mm (see table)
Process connection:	by mounting flange stainless steel **V2A** (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTM 1** **IP 65** (according to EN 60 529) **RGTM 1-KV / RGTM 1-Q**
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

RGTM 1
Basic unit

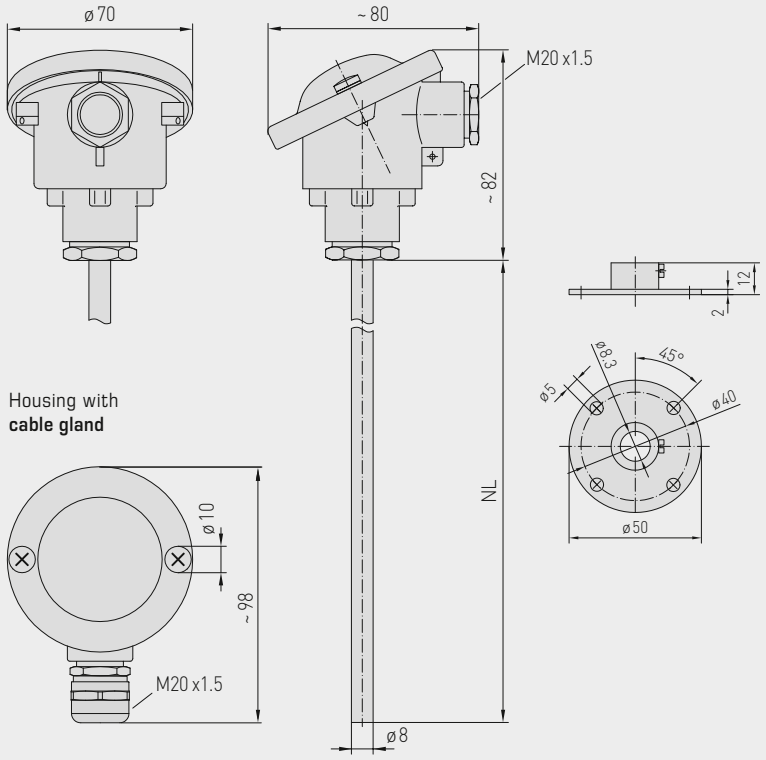


RGTM 1
Measuring insert with ceramic tubelet

Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

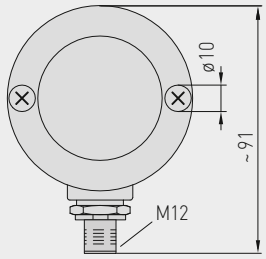
Dimensional drawing
[mm]

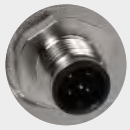
RGTM 1



Housing with
cable gland

Housing with
M12 connector





M12 connector
(male)

RGTM 1
standard
(IP 54)



RGTM 1 - KV
with cable gland
(IP 65)



RGTM 1 - Q
with M12 connector
(IP 65)





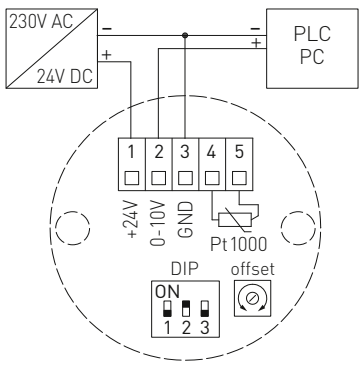
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

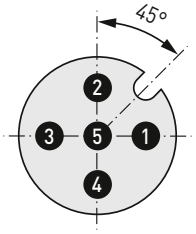
Duct/smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Connecting diagram **RGTM 1-U**



Pin assignment (M12) **RGTM 1-U**

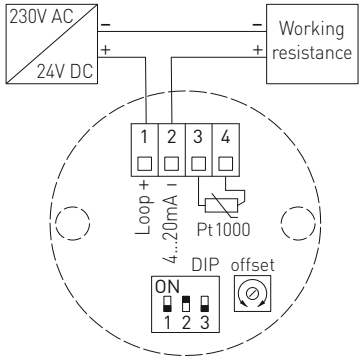


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

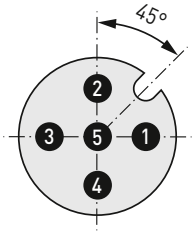
RGTM 1-U
Connecting head



Connecting diagram **RGTM 1-I**



Pin assignment (M12) **RGTM 1-I**



1. +UB 15...36 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND
5. Shield

RGTM 1-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
0... +50 °C (default)	OFF	**ON**	**ON**
0...+100 °C	**ON**	OFF	**ON**
0...+200 °C	OFF	OFF	**ON**
0...+300 °C	**ON**	**ON**	OFF
0...+400 °C	OFF	**ON**	OFF
0...+500 °C	**ON**	OFF	OFF
0...+600 °C	OFF	OFF	OFF

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

RGTM 1
standard
(IP 54)



THERMASGARD® **RGTM 1**	Duct / smoke gas temperature sensor, incl. mounting flange (standard)			
Type / WG01	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 1 - I			**IP 54**, I - variant	
RGTM1-I 200mm	4...20 mA	**200 mm**	1101-3122-0049-810	**296,99 €**
RGTM1-I 250mm	4...20 mA	**250 mm**	1101-3122-0059-810	**308,79 €**
RGTM1-I 300mm	4...20 mA	**300 mm**	1101-3122-0069-810	**312,07 €**
RGTM1-I 400mm	4...20 mA	**400 mm**	1101-3122-0089-810	**314,69 €**
RGTM 1 - U			**IP 54**, U - variant	
RGTM1-U 200mm	0 - 10 V	**200 mm**	1101-3121-0049-810	**296,99 €**
RGTM1-U 250mm	0 - 10 V	**250 mm**	1101-3121-0059-810	**308,79 €**
RGTM1-U 300mm	0 - 10 V	**300 mm**	1101-3121-0069-810	**312,07 €**
RGTM1-U 400mm	0 - 10 V	**400 mm**	1101-3121-0089-810	**314,69 €**
Housing variant:	equipped as standard with pressure screw **(IP 54),** optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional			**26,16 €**

THERMASGARD® RGTM 1

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

RGTM 1 - Q
with M12 connector
(IP 65)



THERMASGARD® **RGTM 1 - Q**	Duct / smoke gas temperature sensor, incl. mounting flange **(with M12 connector)**				
Type / WG01	**Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
RGTM 1 - I xx Q				**IP 65**, I - variant	
RGTM1-I 200mm **Q**	4...20 mA	**200 mm**	●	2001-4131-2100-011	**340,17 €**
RGTM1-I 250mm **Q**	4...20 mA	**250 mm**	●	2001-4131-2100-021	**351,98 €**
RGTM1-I 300mm **Q**	4...20 mA	**300 mm**	●	2001-4131-2100-031	**355,24 €**
RGTM1-I 400mm **Q**	4...20 mA	**400 mm**	●	2001-4131-2100-041	**357,88 €**
RGTM 1 - U xx Q				**IP 54**, U - variant	
RGTM1-U 200mm **Q**	0 - 10 V	**200 mm**	●	2001-4131-1100-011	**340,17 €**
RGTM1-U 250mm **Q**	0 - 10 V	**250 mm**	●	2001-4131-1100-021	**351,98 €**
RGTM1-U 300mm **Q**	0 - 10 V	**300 mm**	●	2001-4131-1100-031	**355,24 €**
RGTM1-U 400mm **Q**	0 - 10 V	**400 mm**	●	2001-4131-1100-041	**357,88 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional				**26,16 €**

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Duct / smoke gas temperature measuring transducer, including mounting flange, calibratable, with multi-range switching and active output

RGTM 1 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTM 1 - KV**	Duct / smoke gas temperature sensor, incl. mounting flange **(with cable gland)**			
Type / WG01	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 1 - I xx KV			**IP 65**, I - variant	
RGTM1-I 200mm **KV**	4...20 mA	**200 mm**	1101-31D2-0049-810	**306,71 €**
RGTM1-I 250mm **KV**	4...20 mA	**250 mm**	1101-31D2-0059-810	**318,53 €**
RGTM1-I 300mm **KV**	4...20 mA	**300 mm**	1101-31D2-0069-810	**321,79 €**
RGTM1-I 400mm **KV**	4...20 mA	**400 mm**	1101-31D2-0089-810	**324,42 €**
RGTM 1 - U xx KV			**IP 65**, U - variant	
RGTM1-U 200mm **KV**	0 - 10 V	**200 mm**	1101-31D1-0049-810	**306,71 €**
RGTM1-U 250mm **KV**	0 - 10 V	**250 mm**	1101-31D1-0059-810	**318,53 €**
RGTM1-U 300mm **KV**	0 - 10 V	**300 mm**	1101-31D1-0069-810	**321,79 €**
RGTM1-U 400mm **KV**	0 - 10 V	**400 mm**	1101-31D1-0089-810	**324,42 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional			**26,16 €**

THERMASGARD® RGTM 2

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable smoke gas / screw-in temperature measuring transducer with neck tube **THERM**ASGARD® **RGTM 2** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube.

The duct sensor is used to detect high temperatures in gaseous or liquid media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RGTM 2
Basic unit



RGTM 2
Measuring insert with ceramic tubelet

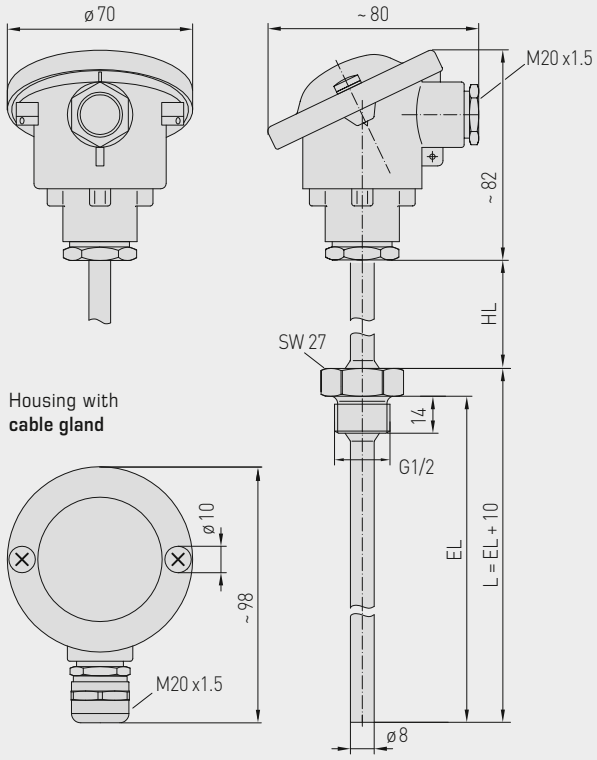
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	10 kOhm (load max. 1 mA) for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60 751, class B) (**Perfect Sensor Protection**)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Cable connection:	**RGTM 2** (Standard) adjusting screw made of metal (M 20 x 1.5); **RGTM 2-KV** (optional) cable gland, brass, nickel-plated (M 20 x 1.5 ; with strain relief, exchangeable, inner diameter 6 - 12 mm) **RGTM 2-Q** (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –30...+70 °C
Protective tube:	stainless steel, **V4A** (1.4571), G ½" straight pipe thread, wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socked with G ½"
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60 529) **RGTM 2** **IP 65** (according to EN 60 529) **RGTM 2-KV / RGTM 2-Q**
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

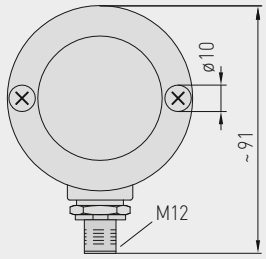
Dimensional drawing [mm]

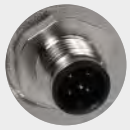
RGTM 2



Housing with **cable gland**

Housing with **M12 connector**





M12 connector (male)

High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

RGTM 2
standard (IP 54)



RGTM 2 - KV
with cable gland (IP 65)



RGTM 2 - Q
with M12 connector (IP 65)

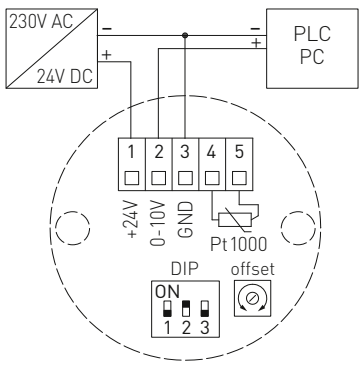




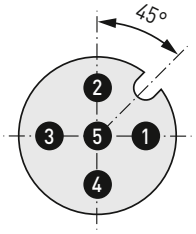
Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Connecting diagram **RGTM 2-U**



Pin assignment (M12) **RGTM 2-U**

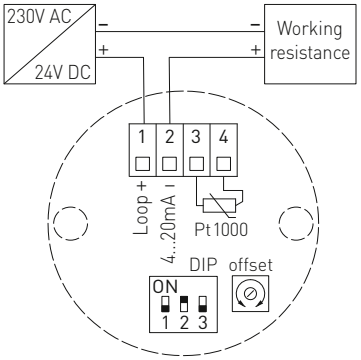


1. +UB 24 V AC/DC
2. Output temperature 0-10 V [°C]
3. free
4. –UB GND
5. Shield

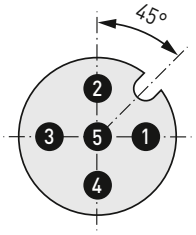
RGTM 2-U
Connecting head



Connecting diagram **RGTM 2-I**



Pin assignment (M12) **RGTM 2-I**



1. +UB 15...36 V DC
2. Output temperature 4...20 mA [°C]
3. free
4. –UB GND
5. Shield

RGTM 2-I
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
0... +50 °C (default)	OFF	**ON**	**ON**
0...+100 °C	**ON**	OFF	**ON**
0...+200 °C	OFF	OFF	**ON**
0...+300 °C	**ON**	**ON**	OFF
0...+400 °C	OFF	**ON**	OFF
0...+500 °C	**ON**	OFF	OFF
0...+600 °C	OFF	OFF	OFF

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

RGTM 2
standard
(IP 54)



THERMASGARD® RGTM 2	Screw-in / smoke gas temperature measuring transducer with neck tube (standard)			
Type / WG01	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 2 - I			**IP 54**, I - variant	
RGTM2-I 100/80mm	4...20 mA	**100 mm**	1101-2162-0029-810	**288,48 €**
RGTM2-I 150/80mm	4...20 mA	**150 mm**	1101-2162-0039-810	**293,71 €**
RGTM2-I 200/80mm	4...20 mA	**200 mm**	1101-2162-0049-810	**296,33 €**
RGTM2-I 250/80mm	4...20 mA	**250 mm**	1101-2162-0059-810	**308,13 €**
RGTM2-I 300/80mm	4...20 mA	**300 mm**	1101-2162-0069-810	**312,07 €**
RGTM2-I 400/80mm	4...20 mA	**400 mm**	1101-2162-0089-810	**313,39 €**
RGTM 2 - U			**IP 54**, U - variant	
RGTM2-U 100/80mm	0 - 10 V	**100 mm**	1101-2161-0029-810	**288,48 €**
RGTM2-U 150/80mm	0 - 10 V	**150 mm**	1101-2161-0039-810	**293,71 €**
RGTM2-U 200/80mm	0 - 10 V	**200 mm**	1101-2161-0049-810	**296,33 €**
RGTM2-U 250/80mm	0 - 10 V	**250 mm**	1101-2161-0059-810	**308,13 €**
RGTM2-U 300/80mm	0 - 10 V	**300 mm**	1101-2161-0069-810	**312,07 €**
RGTM2-U 400/80mm	0 - 10 V	**400 mm**	1101-2161-0089-810	**313,39 €**
Housing variant:	equipped as standard with pressure screw **(IP 54)**, optional housing variants with cable gland **(IP 65)** or **M12 connector (IP65)** see the next page!			
Extra charge:	other measuring ranges optional			**26,16 €**

THERMASGARD® RGTM 2

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

RGTM 2 - Q
with M12 connector
(IP 65)



THERMASGARD® **RGTM 2 - Q**	Screw-in / smoke gas temperature measuring transducer with neck tube **(with M12 connector)**				
Type / WG01	**Output**	**Installation length (EL)**	**Q** ●	**Item No.**	**Price**
RGTM 2 - I xx Q				**IP 65**, I - variant	
RGTM2-I 100/80mm **Q**	4...20 mA	**100 mm**	●	2001-4141-2100-011	**331,66 €**
RGTM2-I 150/80mm **Q**	4...20 mA	**150 mm**	●	2001-4141-2100-021	**336,91 €**
RGTM2-I 200/80mm **Q**	4...20 mA	**200 mm**	●	2001-4141-2100-031	**340,73 €**
RGTM2-I 250/80mm **Q**	4...20 mA	**250 mm**	●	2001-4141-2100-041	**351,31 €**
RGTM2-I 300/80mm **Q**	4...20 mA	**300 mm**	●	2001-4141-2100-051	**355,24 €**
RGTM2-I 400/80mm **Q**	4...20 mA	**400 mm**	●	2001-4141-2100-061	**356,58 €**
RGTM 2 - U xx Q				**IP 65**, U - variant	
RGTM2-U 100/80mm **Q**	0 - 10 V	**100 mm**	●	2001-4141-1100-011	**331,66 €**
RGTM2-U 150/80mm **Q**	0 - 10 V	**150 mm**	●	2001-4141-1100-021	**336,91 €**
RGTM2-U 200/80mm **Q**	0 - 10 V	**200 mm**	●	2001-4141-1100-031	**340,73 €**
RGTM2-U 250/80mm **Q**	0 - 10 V	**250 mm**	●	2001-4141-1100-041	**351,31 €**
RGTM2-U 300/80mm **Q**	0 - 10 V	**300 mm**	●	2001-4141-1100-051	**355,24 €**
RGTM2-U 400/80mm **Q**	0 - 10 V	**400 mm**	●	2001-4141-1100-061	**356,58 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional				**26,16 €**

ACCESSORIES

Special accessories for M12 connector
see chapter Accessories!

Screw-in / smoke gas temperature measuring transducer, with neck tube, calibratable, with multi-range switching and active output

RGTM 2 - KV
with cable gland
(IP 65)



THERMASGARD® **RGTM 2 - KV**	Screw-in / smoke gas temperature measuring transducer with neck tube **(with cable gland)**			
Type / WG01	**Output**	**Installation length (EL)**	**Item No.**	**Price**
RGTM 2 - I xx KV			**IP 65**, I - variant	
RGTM2-I 100/80mm **KV**	4...20 mA	**100 mm**	1101-21D2-0029-810	**298,20 €**
RGTM2-I 150/80mm **KV**	4...20 mA	**150 mm**	1101-21D2-0039-810	**303,43 €**
RGTM2-I 200/80mm **KV**	4...20 mA	**200 mm**	1101-21D2-0049-810	**306,05 €**
RGTM2-I 250/80mm **KV**	4...20 mA	**250 mm**	1101-21D2-0059-810	**317,87 €**
RGTM2-I 300/80mm **KV**	4...20 mA	**300 mm**	1101-21D2-0069-810	**321,79 €**
RGTM2-I 400/80mm **KV**	4...20 mA	**400 mm**	1101-21D2-0089-810	**323,10 €**
RGTM 2 - U xx KV			**IP 65**, U - variant	
RGTM2-U 100/80mm **KV**	0 - 10 V	**100 mm**	1101-21D1-0029-810	**298,20 €**
RGTM2-U 150/80mm **KV**	0 - 10 V	**150 mm**	1101-21D1-0039-810	**303,43 €**
RGTM2-U 200/80mm **KV**	0 - 10 V	**200 mm**	1101-21D1-0049-810	**306,05 €**
RGTM2-U 250/80mm **KV**	0 - 10 V	**250 mm**	1101-21D1-0059-810	**317,87 €**
RGTM2-U 300/80mm **KV**	0 - 10 V	**300 mm**	1101-21D1-0069-810	**321,79 €**
RGTM2-U 400/80mm **KV**	0 - 10 V	**400 mm**	1101-21D1-0089-810	**323,10 €**
Housing variant "KV":	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional			**26,16 €**

THERMASGARD® HFTM

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)
Calibratable temperature measuring transducer with sleeve sensor **THERM**ASGARD® **HFTM**, with eight switchable measuring ranges (max. –20...+150 °C), aktivem Ausgang, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

HFTM
with cable gland



HFTM - Q
with M12 connector



TECHNICAL DATA

HFTM - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
HFTM - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**) at IP68)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), Ø = 6 mm, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Temperature [°C]



Temperature [°F]



Sensor breakage



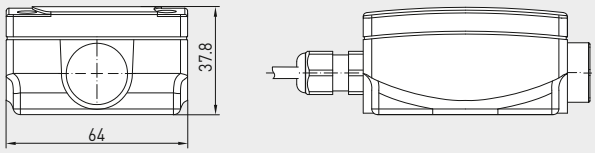
Sensor short circuit

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

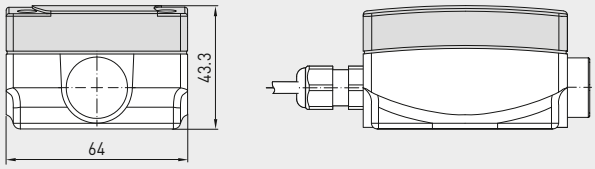
Dimensional drawing
[mm]

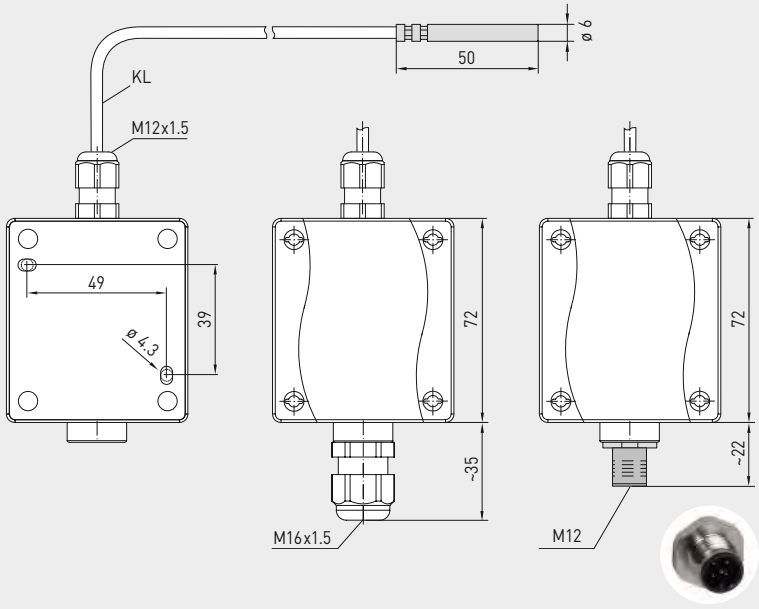
HFTM

without display



with display





Housing with
cable gland

Housing with
M12 connector

HFTM
with cable gland
and display



HFTM-Q
with M12 connector
and display



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection



IP54 (optional)
with **glass fibre** cable

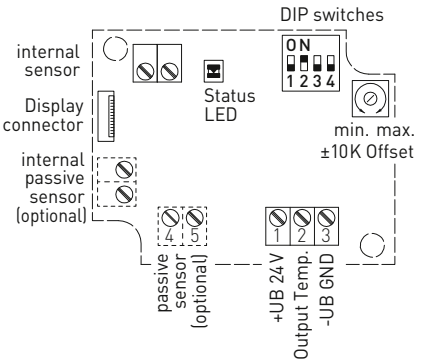
THERMASGARD® HFTM

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **HFTM xx**



2-wire connection* **HFTM - I**

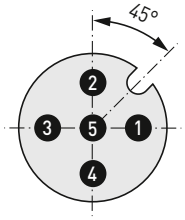
1	+UB 24V DC
2	Output Temp. 4...20mA
3	–UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) **HFTM - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	–UB GND

Pin assignment (M12) **HFTM xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

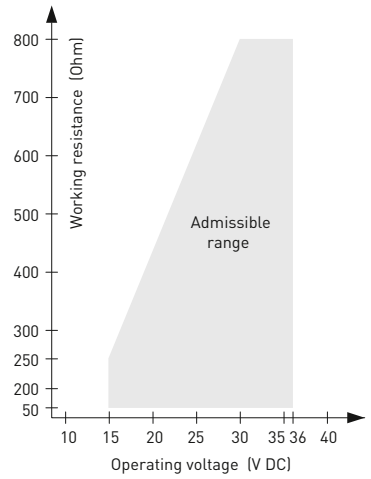
Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

SI IMP

Load resistance diagram (2-wire) **HFTM - I**



For further technical information, see the operating instructions

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

HFTM-Q
with M12 connector





HFTM
with cable gland

THERMASGARD® HFTM	Sleeve sensor with temperature measuring transducer (with cable gland)				
Type / WG01	**Output**	**Type**	**Display**	**Item No.**	**Price**
HFTM-I	**(2-wire)**				
HFTM-I	4...20 mA	Remote sensor		1101-1152-0219-920	**107,65 €**
HFTM-I LCD	4...20 mA	Remote sensor	■	1101-1152-2219-920	**160,11 €**
HFTM-A	**(3-wire AOS)**				
HFTM-A	0-10 V / 4...20 mA	Remote sensor		1101-115E-0219-920	**107,65 €**
HFTM-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-115E-2219-920	**160,11 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Housing variant:	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**26,16 €**
	Protection type **IP68** (Sensor sleeve watertight compound-filled)				**3,50 €**
	2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)			on request	
	Other lengths of protection sleeve optional			on request	

THERMASGARD® HFTM-Q	Sleeve sensor with temperature measuring transducer (with M12 connector)				
Type / WG01I	**Output**	**Type**	**Display ● = Q**	**Item No.**	**Price**
HFTM-I Q	**(2-wire)**				
HFTM-I Q	4...20 mA	Remote sensor	●	2001-2111-2100-001	**150,82 €**
HFTM-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2112-2100-001	**203,28 €**
HFTM-A Q	**(3-wire AOS)**				
HFTM-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2111-B100-001	**150,82 €**
HFTM-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2112-B100-001	**203,28 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	see table above!				

ACCESSORIES		
THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm	
	Special accessories for M12 connector	see chapter Accessories!

THERMASGARD® HFTM - VA

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)
Calibratable temperature measuring transducer with sleeve sensor **THERM**ASGARD® **HFTM - VA**, with eight switchable measuring ranges (max. –20...+150 °C), active output, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable). A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

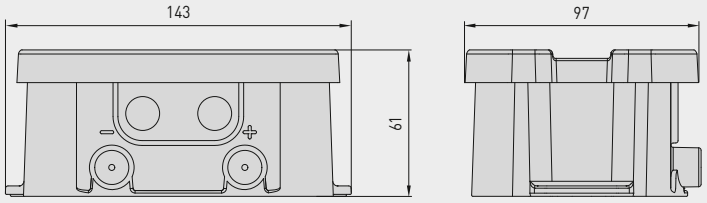
TECHNICAL DATA

HFTM - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
HFTM - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection** at IP68)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), Ø = 6 mm, nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, 2x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Typ 2E)
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional) **IP 54** (according to EN 60 529) with **glass fibre** cable (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)

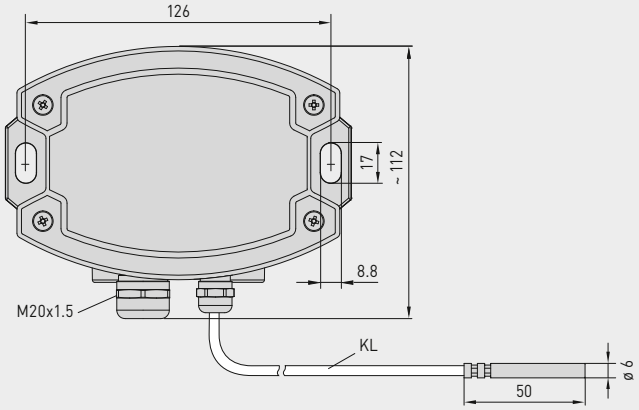
Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

Dimensional drawing
[mm]

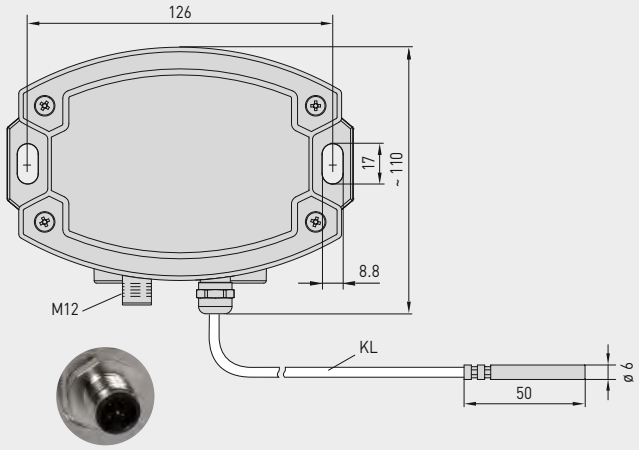
HFTM - VA



Housing with
cable gland



Housing with
M12 connector



HFTM - VA
with cable gland



HFTM - VAQ
with M12 connector



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection



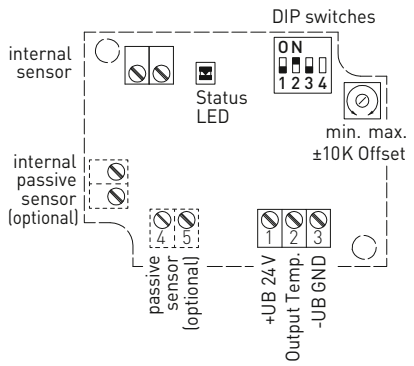
IP54 (optional)
with **glass fibre** cable

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram without display **HFTM xx**



2-wire connection without display **HFTM - I**



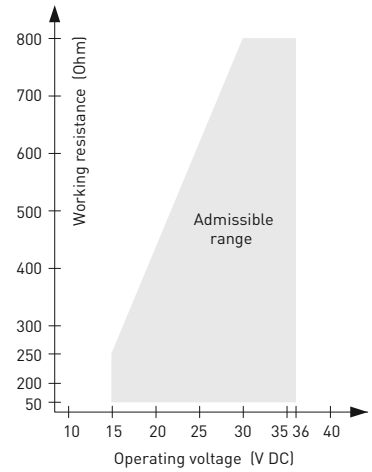
1 +UB 24V DC
2 Output Temp. 4...20mA
3 free

3-wire connection (AOS) without display **HFTM - A**



1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA
3 -UB GND

Load resistance diagram (2-wire) **HFTM - I**

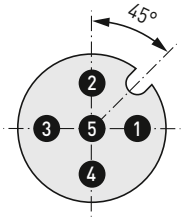


Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

DIP4 has no function!

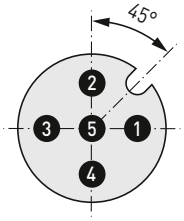
For further technical information, see the operating instructions

Pin assignment (M12) **HFTM-A VAQ**



1 +UB 24V AC/DC
2 Output Temperature 0-10V / 4...20mA
3 free
4 -UB GND
5 Shield

Pin assignment (M12) **HFTM-I VAQ**



1 +UB 24V DC
2 Output Temperature 4...20mA
3 free
4 free
5 Shield

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

HFTM - VAQ
with M12 connector



HFTM - VA
with cable gland



THERMASGARD® **HFTM - VA**	Sleeve sensor with temperature measuring transducer, *ID* (Stainless steel housing **with cable gland**)			
Type / WG02I	**Output**	**Type**	**Item No.**	**Price**
HFTM - I VA	(**2-wire**)			
HFTM-I VA	4...20 mA	Remote sensor	2001-2141-2200-001	**394,82 €**
HFTM - A VA	(**3-wire AOS**)			
HFTM-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2141-B200-001	**394,82 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant:	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional Protection type **IP 68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**) Other lengths of protection sleeve optional		 on request on request	**26,16 €** **3,50 €**

THERMASGARD® **HFTM - VAQ**	Sleeve sensor with temperature measuring transducer, *ID* (Stainless steel housing **with M12 connector**)				
Type / WG01I	**Output**	**Type**	**● = Q**	**Item No.**	**Price**
HFTM - I VAQ	(**2-wire**)				
HFTM-I VAQ	4...20 mA	Remote sensor	●	2001-2141-2100-001	**434,53 €**
HFTM - A VAQ	(**3-wire AOS**)				
HFTM-A VAQ	0-10 V / 4...20 mA	Remote sensor	●	2001-2141-B100-001	**434,53 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional Protection type **IP 68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**) Other lengths of protection sleeve optional			 on request on request	**26,16 €** **3,50 €**

ACCESSORIES		
THE-xx	**Immersion sleeve**, stainless steel **V4A** (1.4571) or nickel-plated brass, Ø = 9 mm	
	Special accessories for M12 connector	see chapter Accessories !

THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active outputg (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable surface-contact temperature measuring transducer **THERM**ASGARD® **ALTM 1**, with eight switchable measuring ranges (max. –20...+150 °C), active output, compact variant incl. strap, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with / without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 1



TECHNICAL DATA

ALTM 1 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
ALTM 1 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) T_{max} **up to +100 °C**, operating range –50...+100 °C **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	endless strap with metal tightener, (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), length L = 300 mm
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Temperature [°C]



Temperature [°F]



Sensor breakage

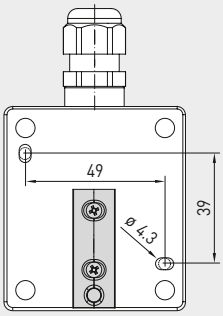


Sensor short circuit

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

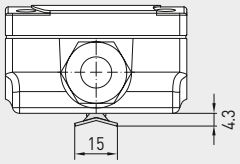
Dimensional drawing
[mm]

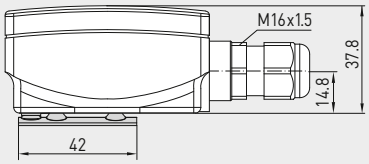
ALTM 1



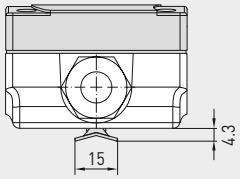


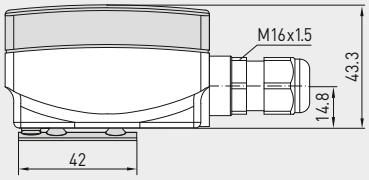
without display

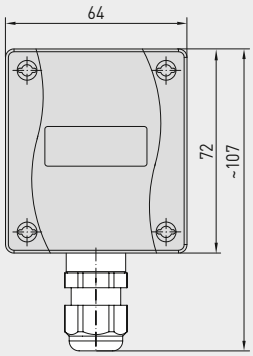




with display









M12 connector
(optional on request)

ALTM 1
with display



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

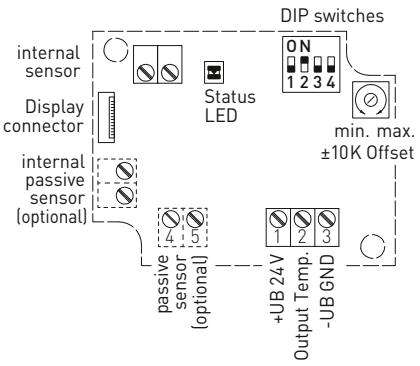
THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **ALTM 1 xx**



2-wire connection* **ALTM 1 - I**

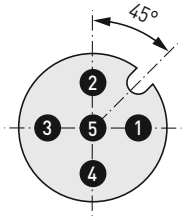
1 +UB 24V DC
2 Output Temp. 4...20mA
3 –UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) **ALTM 1 - A**

1 +UB 24V AC/DC
2 Output Temp. 0-10V / 4...20mA
3 –UB GND

Pin assignment (M12) **ALTM 1 xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

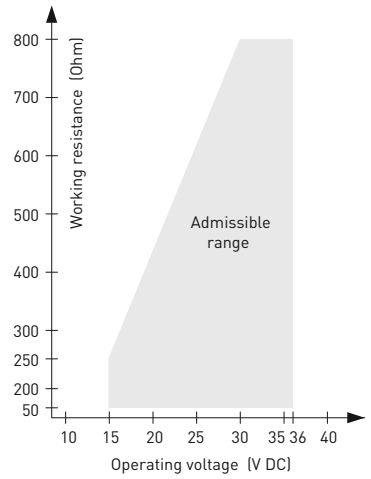
Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

SI IMP

Load resistance diagram (2-wire) **ALTM 1 - I**



For further technical information, see the operating instructions

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

ALTM 1 - Q
with M12 connector
(on request)



ALTM 1
with cable gland



THERMASGARD® ALTM 1	Surface contact / tube contact temperature measuring transducers (compact variant)				
Type / WG01	**Output**	**Type**	**Display**	**Item No.**	**Price**
ALTM 1 - I	**(2-wire)**				
ALTM1-I	4...20 mA	compact		1101-1112-0219-920	**108,18 €**
ALTM1-I LCD	4...20 mA	compact	■	1101-1112-2219-920	**160,64 €**
ALTM 1 - A	**(3-wire AOS)**				
ALTM1-A	0-10 V / 4...20 mA	compact		1101-111E-0219-920	**108,18 €**
ALTM1-A LCD	0-10 V / 4...20 mA	compact	■	1101-111E-2219-920	**160,64 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	Other ranges optional Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	**26,16 €**

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**
	Special accessories for M12 connector see chapter Accessories!		

THERMASGARD® ALTM 2

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)
Calibratable tube contact temperature measuring transducer **THERM**ASGARD® **ALTM 2**, with eight switchable measuring ranges (max. –20...+150 °C), active output, external sensor, incl. strap, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with / without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

ALTM 2
with cable gland



ALTM 2 - Q
with M12 connector



TECHNICAL DATA

ALTM 2 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a [Ohm] = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
ALTM 2 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) T_{max} **up to +100 °C**, operating range –50...+150 °C **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**) at IP68)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless stee **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	Silicone, SiHF, 2 x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display



Temperature [°C]



Temperature [°F]



Sensor breakage



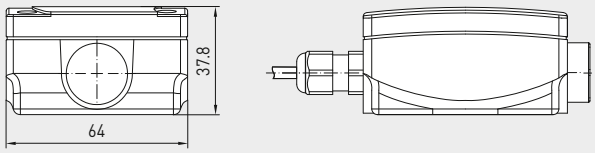
Sensor short circuit

Surface contact/tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

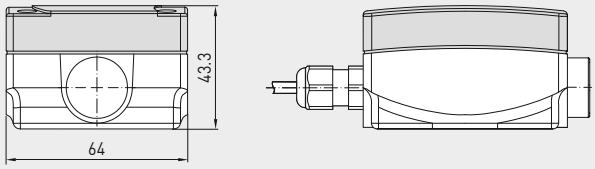
Dimensional drawing
[mm]

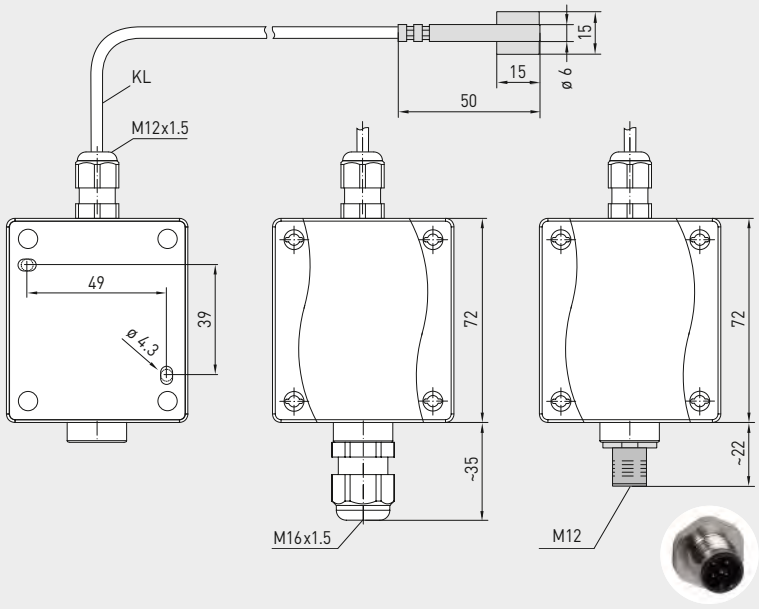
ALTM 2

without display



with display





Housing with
cable gland

Housing with
M12 connector

ALTM 2
with cable gland
and display



ALTM 2 - Q
with M12 connector
and display



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION



IP 65 (standard)
humidity-tight



IP 68 (optional)
water-tight
Perfect Sensor Protection

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

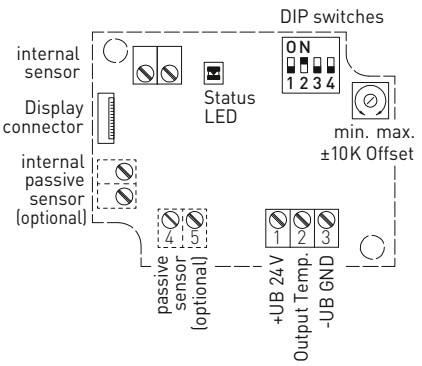
THERMASGARD® ALTM 2

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **ALTM 2 xx**



2-wire connection* **ALTM 2 - I**

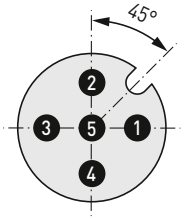
1	+UB 24V DC
2	Output Temp. 4...20mA
3	–UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) **ALTM 2 - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	–UB GND

Pin assignment (M12) **ALTM 2 xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

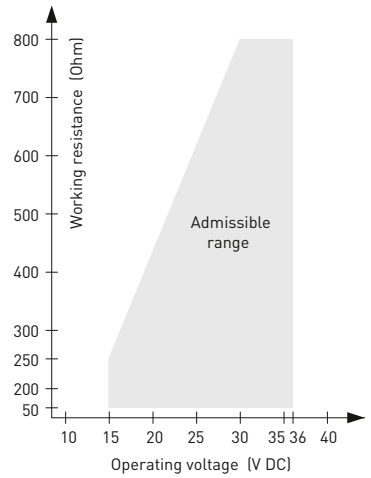
Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

SI IMP

Load resistance diagram (2-wire) **ALTM 2 - I**



For further technical information, see the operating instructions

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

ALTM 2 - Q
with M12 connector





ALTM 2
with cable gland

THERMASGARD® ALTM 2	Surface contact / tube contact temperature measuring transducers (with cable gland)				
Type / WG01	**Output**	**Type**	**Display**	**Item No.**	**Price**
ALTM 2 - I	**(2-wire)**				
ALTM2-I	4...20 mA	Remote sensor		1101-1122-0219-920	**115,38 €**
ALTM2-I LCD	4...20 mA	Remote sensor	■	1101-1122-2219-920	**167,85 €**
ALTM 2 - A	**(3-wire AOS)**				
ALTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-112E-0219-920	**115,38 €**
ALTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-112E-2219-920	**167,85 €**
Automatic Output Switching (AOS):	Patentierte Analog-Schnittstelle (Patent-Nr. DE 10 2015 015 941 B4) Gerät erkennt automatisch den erforderlichen Ausgangstyp 0-10 V oder 4...20 mA.				
Housing variant:	Cable connection **with cable gland**				
Extra charge:	other measuring ranges optional				**26,16 €**
	Protection type **IP68** (Sensor sleeve watertight compound-filled)				**3,50 €**
	2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)			on request	

THERMASGARD® ALTM 2 - Q	Surface contact / tube contact temperature measuring transducers (with M12 connector)				
Type / WG01I	**Output**	**Type**	**Display ● = Q**	**Item No.**	**Price**
ALTM 2 - I Q	**(2-wire)**				
ALTM2-I Q	4...20 mA	Remote sensor	●	2001-2121-2100-001	**158,57 €**
ALTM2-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2122-2100-001	**211,02 €**
ALTM 2 - A Q	**(3-wire AOS)**				
ALTM2-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2121-B100-001	**158,57 €**
ALTM2-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2122-B100-001	**211,02 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	see table above!				

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**
	Special accessories for M12 connector see chapter Accessories!		

THERMASGARD® ALTM 2 - VA

NEW

S+S REGELTECHNIK

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

Patented quality product (patent no. DE 10 2015 015 941 B4)
Calibratable tube contact temperature measuring transducer **THERM**ASGARD® **ALTM 2 - VA**, with eight switchable measuring ranges (max. –20...+150 °C), active output, external sensor, incl. strap, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

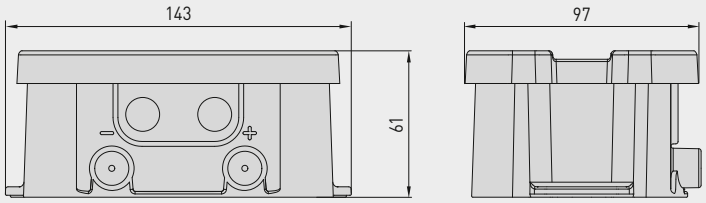
TECHNICAL DATA

ALTM 2 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
ALTM 2 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **T_{max} up to +100 °C**, operating range –50...+150 °C **with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B (**Perfect Sensor Protection**) at IP68)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless stee **V4A** (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	Silicone, SiHF, 2x 0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Typ 2E)
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	endless strap with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	**IP 65** (according to EN 60 529) **sleeve** humidity-tight (standard) **IP 68** (according to EN 60 529) **sleeve** water-tight (optional)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)

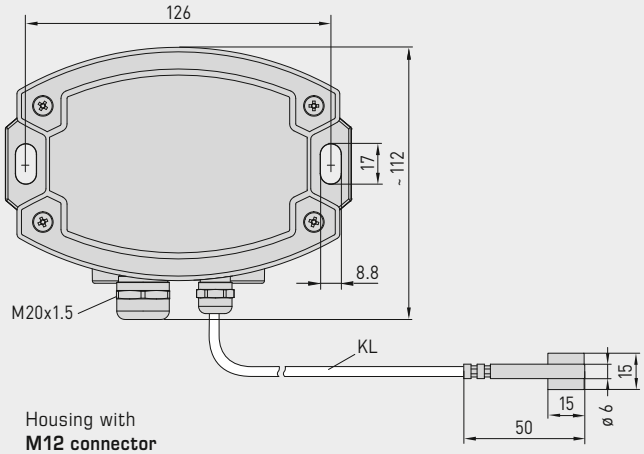
Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

Dimensional drawing
[mm]

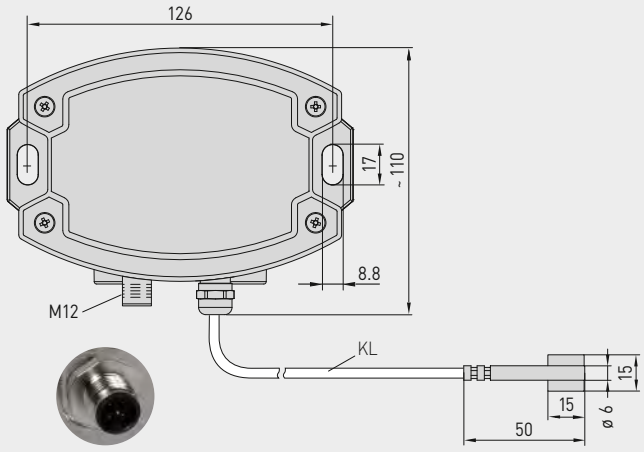
ALTM 2 - VA



Housing with
cable gland



Housing with
M12 connector



ALTM 2 - VA
with cable gland



ALTM 2 - VAQ
with M12 connector



High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection

Automatic detection and switching to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

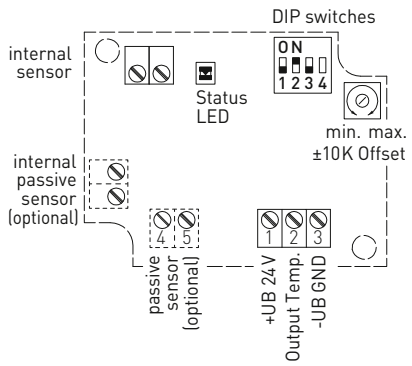
THERMASGARD® ALTM 2 - VA

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram without display **ALTM 2 xx**



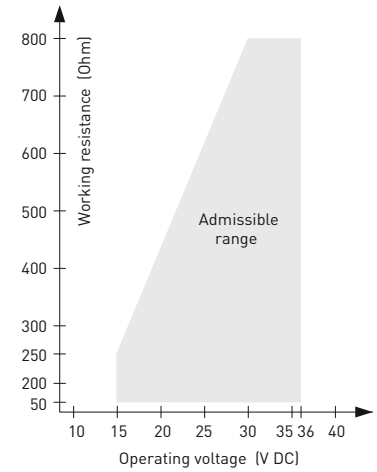
2-wire connection without display **ALTM 2 - I**

1	+UB 24V DC
2	Output Temp. 4...20mA
3	free

3-wire connection (AOS) without display **ALTM 2 - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	-UB GND

Load resistance diagram (2-wire) **ALTM 2 - I**

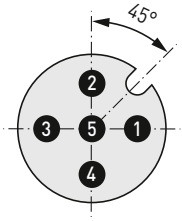


Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
−20...+150 °C	**ON**	**ON**	**ON**
−50... +50 °C	OFF	**ON**	**ON**
−20... +80 °C	**ON**	OFF	**ON**
−30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

DIP4 has no function!

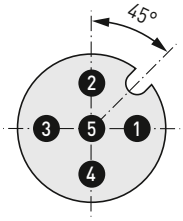
For further technical information, see the operating instructions

Pin assignment (M12) **ALTM 2 - A VAQ**



1	+UB 24V AC/DC
2	Output Temperature 0-10V / 4...20mA
3	free
4	-UB GND
5	Shield

Pin assignment (M12) **ALTM 2 - I VAQ**



1	+UB 24V DC
2	Output Temperature 4...20mA
3	free
4	free
5	Shield

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

ALTM 2 - VAQ
with M12 connector



ALTM 2 - VA
with cable gland



THERMASGARD® ALTM 2 - VA	Surface contact / tube contact temperature measuring transducers, *ID* (Stainless steel housing **with cable gland**)			
Type / WG021	**Output**	**Type**	**Item No.**	**Price**
ALTM 2 - I VA	(**2-wire**)			
ALTM2-I VA	4...20 mA	Remote sensor	2001-2151-2200-001	**406,45 €**
ALTM 2 - A VA	(**3-wire AOS**)			
ALTM2-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2151-B200-001	**406,45 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant:	Cable connection **with cable gland**			
Extra charge:	other measuring ranges optional Protection type **IP 68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)		on request	**26,16 €** **3,50 €**

THERMASGARD® ALTM 2 - VAQ	Surface contact / tube contact temperature measuring transducers, *ID* (Stainless steel housing **with M12 connector**)				
Type / WG021	**Output**	**Type**	**● = Q**	**Item No.**	**Price**
ALTM 2 - I VAQ	(**2-wire**)				
ALTM2-I VAQ	4...20 mA	Remote sensor	●	2001-2151-2100-001	**446,14 €**
ALTM 2 - A VAQ	(**3-wire AOS**)				
ALTM2-A VAQ	0-10 V / 4...20 mA	Remote sensor	●	2001-2151-B100-001	**446,14 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)				
Extra charge:	other measuring ranges optional Protection type **IP 68** (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (**silicone / PTFE / glass fibre**)			on request	**26,16 €** **3,50 €**

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	**4,79 €**
	Special accessories for M12 connector see chapter Accessories!		

THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERM**ASGARD® **RPTM 1**, with eight switchable measuring ranges (max. –20...+150 °C), active output, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with / without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPTM 1
with cable gland



TECHNICAL DATA

RPTM 1 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
RPTM 1 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **T_{min} –5 °C, T_{max} +60 °C, with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B
Deviation, temperature:	typically ± 0.2 K at +25 °C
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Sensor cable:	PVC, H03VV-F, 2 x 0.5 mm², KL = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (sensor breakage, sensor short circuit)
ACCESSORIES	(see table)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

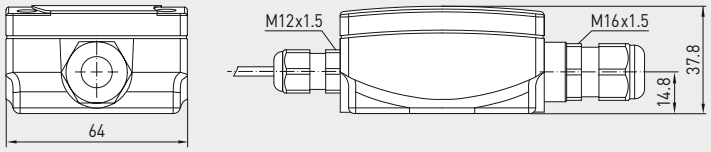


Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

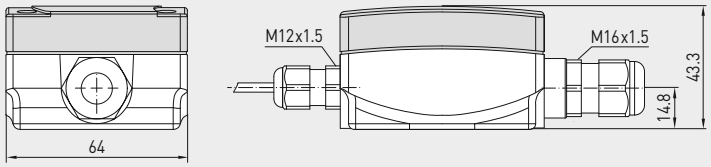
Dimensional drawing
[mm]

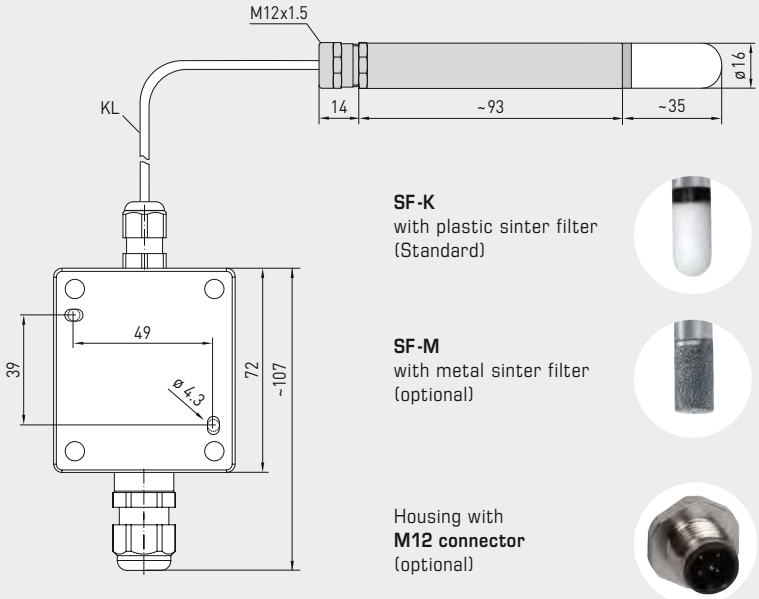
RPTM 1

without display



with display





SF-K
with plastic sinter filter
(Standard)

SF-M
with metal sinter filter
(optional)

Housing with
M12 connector
(optional)

RPTM 1
with cable gland
and display



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

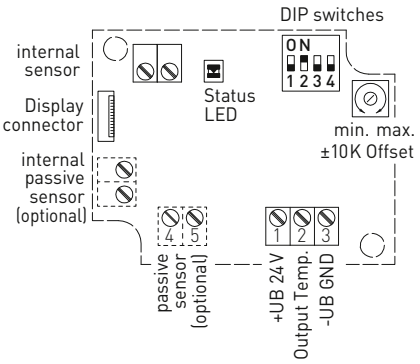
THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **RPTM 1 xx**



2-wire connection* **RPTM 1 - I**

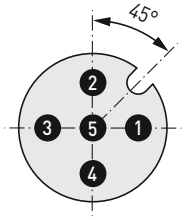
1	+UB 24V DC
2	Output Temp. 4...20mA
3	–UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) **RPTM 1 - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	–UB GND

Pin assignment (M12) **RPTM 1 xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

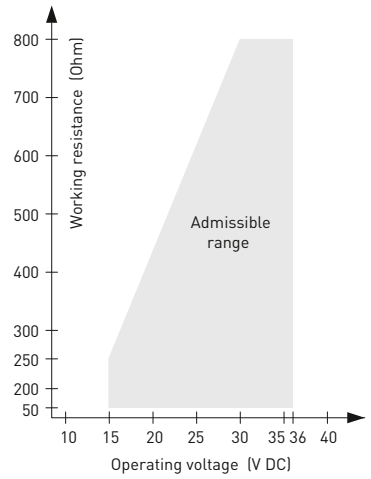
Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

SI IMP

Load resistance diagram (2-wire) **RPTM 1 - I**



For further technical information, see the operating instructions

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

RPTM 1 - Q
with M12 connector
(on request)





RPTM 1
with cable gland

THERMASGARD® **RPTM 1**	Pendulum room temperature measuring transducer (with stainless steel sleeve)				
Type / WG01	**Output**	**Type**	**Display**	**Item No.**	**Price**
RPTM 1 - I	**(2-wire)**				
RPTM1-I	4...20 mA	Remote sensor		1101-1162-0219-910	**156,31 €**
RPTM1-I LCD	4...20 mA	Remote sensor	■	1101-1162-2219-910	**207,63 €**
RPTM 1 - A	**(3-wire AOS)**				
RPTM1-A	0-10 V / 4...20 mA	Remote sensor		1101-116E-0219-910	**156,31 €**
RPTM1-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-116E-2219-910	**207,63 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	other measuring ranges optional 2-wire connecting leads, per running meter (**PVC**) Cable connection with **M12 connector** according to DIN EN 61076-2-101			 on request on request	**26,16 €**

ACCESSOIRES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**

THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room pendulum temperature measuring transducer (with globe) **THERM**ASGARD® **RPTM 2**, with eight switchable measuring ranges (max. –20...+150 °C), active output, cable sensor with a black plastic globe, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with / without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

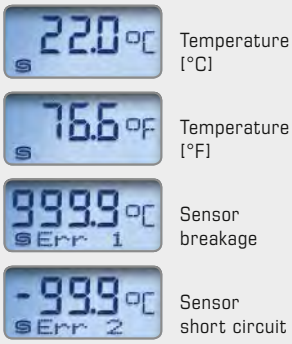
RPTM 2
with cable gland



TECHNICAL DATA

RPTM 2 - I	
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A
Connection type:	2-wire connection
Output:	**4...20 mA**
RPTM 2 - A (AOS)	
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L = 25...450 Ohm with AOS I variant R_L > 15 kOhm with AOS U variant
Connection type:	3-wire connection
Output:	**automatic 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the unit detects the required output type and automatically switches to U or I output)
GENERAL	
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	**SI** (default) or **Imperial** (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	**multi-range switching with 8 measuring ranges,** see table (other ranges optional) **T_{min} –5 °C, T_{max} +60 °C, with manual zero point correction (± 10 K)**
Sensor:	Pt1000, DIN EN 60751, class B
Deviation, temperature:	typically ± 0.2 K at +25 °C
Globe:	plastic, colour black, Ø = 50 mm
Sensor cable:	PVC, H03VV-F, 2 x 0.5 mm², KL = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Ambient temperature:	measuring transducer –30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying the **ACTUAL temperature** and the **internal diagnostics** (sensor breakage, sensor short circuit)

Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

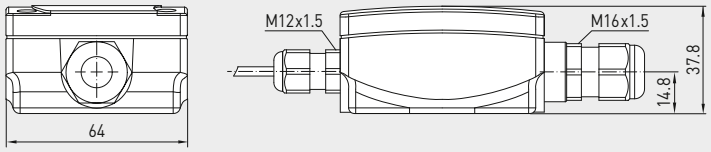


Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

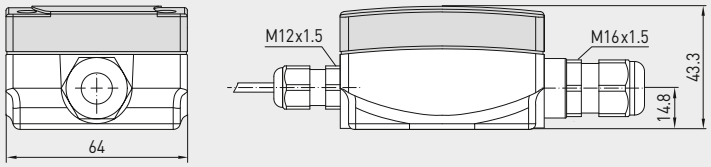
Dimensional drawing
[mm]

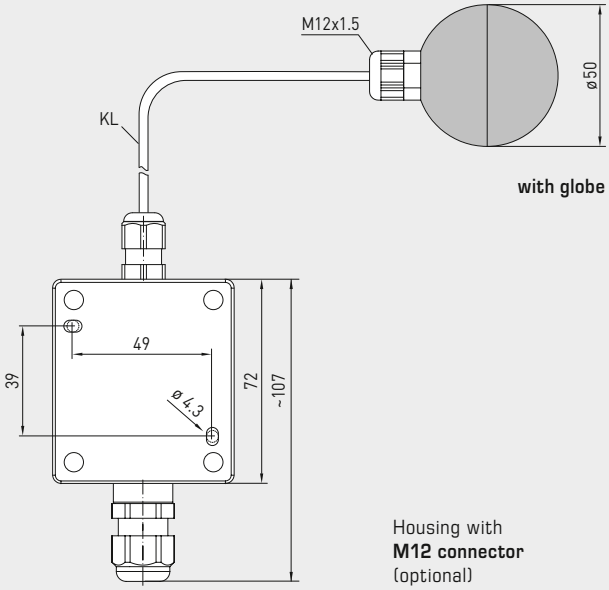
RPTM 2

without display



with display





with globe

Housing with
M12 connector
(optional)



RPTM 2
with cable gland
and display



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

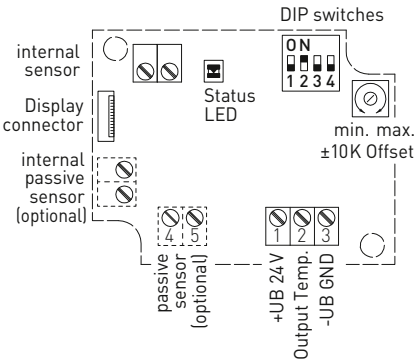
THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

NEW

S+S REGELTECHNIK

Schematic diagram **RPTM 2 xx**



2-wire connection* **RPTM 2 - I**

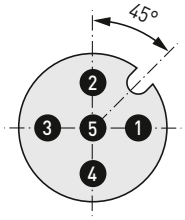
1	+UB 24V DC
2	Output Temp. 4...20mA
3	–UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) **RPTM 2 - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	–UB GND

Pin assignment (M12) **RPTM 2 xx**



1 +UB 24V
2 Output temperature
3 free
4 –UB GND
5 Shield

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
–20...+150 °C	**ON**	**ON**	**ON**
–50... +50 °C	OFF	**ON**	**ON**
–20... +80 °C	**ON**	OFF	**ON**
–30... +60 °C	OFF	OFF	**ON**
0... +40 °C	**ON**	**ON**	OFF
0... +50 °C (default)	OFF	**ON**	OFF
0...+100 °C	**ON**	OFF	OFF
0...+150 °C	OFF	OFF	OFF

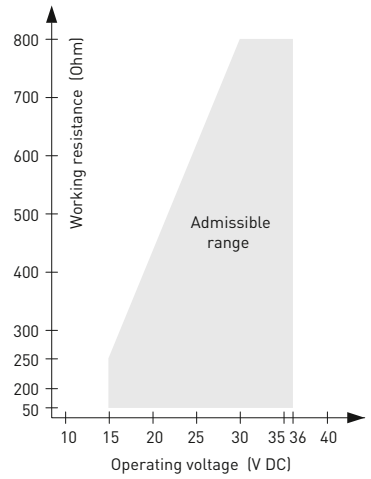
Display (switchable)		DIP 4
Imperial	[°F]	**ON**
SI (default)	[°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP4**).

SI IMP

Load resistance diagram (2-wire) **RPTM 2 - I**



For further technical information, see the operating instructions

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

RPTM 2 - Q
with M12 connector
(on request)





RPTM 2
with cable gland

THERMASGARD® **RPTM 2**	Pendulum room temperature measuring transducers (with globe)				
Type / WG01	**Output**	**Type**	**Display**	**Item No.**	**Price**
RPTM 2 - I	**(2-wire)**				
RPTM2-I	4...20 mA	Remote sensor		1101-1172-0219-910	**157,34 €**
RPTM2-I LCD	4...20 mA	Remote sensor	■	1101-1172-2219-910	**208,67 €**
RPTM 2 - A	**(3-wire AOS)**				
RPTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-117E-0219-910	**157,34 €**
RPTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-117E-2219-910	**208,67 €**
Automatic Output Switching (AOS):	Patented analogueinterface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	other measuring ranges optional				**26,16 €**
	2-wire connecting leads, per running meter (**PVC**)			on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

Temperature

THERMASREG® **Temperature controllers** – everything under control from hot to cold

Our temperature controllers and thermostats are known for their rugged, long-life and reliable measuring technology, widely field-proven in everyday use.

Well engineered and manufactured in customized versions, these devices have a perfect fit in high-end installations.

Application Areas

- Office and administration buildings
- Schools, hotels and public authorities
- Power plants and district heating plants
- Industrial buildings and production facilities
- Foodstuff industry
- Heating and ventilation systems



S+S REGELTECHNIK



THERMASREG®
TEMPERATURE CONTROLLERS, THERMOSTATS

Room temperature controllers

RTR-B	Room temperature controller	**337**

Surface contact thermostats

ALTR 060	Surface-contact thermostat	**354**
ALTR 090	Surface-contact thermostat	**354**
ALTR 1	Surface-contact thermostat	**355**
ALTR 3	Surface-contact thermostat	**355**
ALTR 5	Surface-contact thermostat	**355**
ALTR 7	Surface-contact thermostat	**355**

Built-in controllers, duct controllers

ETR	Built-in temperature controller, one-step / two-step	**345**
KTR	Duct temperature controller, one-step / two-step	**351**
TRxx-F	Temperature controller with remote sensor	**341**
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	**363**

Wet room temperature controllers

TR 040	Temperature controller	**338**
TR 060	Temperature controller	**338**
TR 22	Temperature controller	**339**
TR 04040	Temperature controller, two-step	**340**

Frost protection thermostats

FST	Frost protection thermostat, mechanical, one-step, switching	**359**
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	**363**
FS-20	2-phase frost protection thermostat, with control and cascading input, two-step, switching	**367**

Immersion sleeves and accessories

see chapter Accessories	**638**

Room temperature controllers, mechanical, on-wall

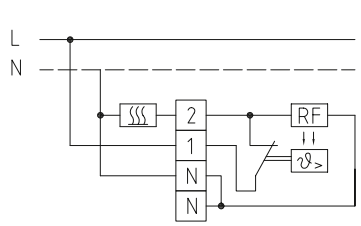
S+S REGELTECHNIK

One-step mechanical single room controller **THERM**ASREG® **RTR - B** in bi-metal technology with thermal feedback for monitoring or controlling temperatures in dry rooms, or for activating any kind of heating system as room thermostat. For currentless open radiator valves, the cooling output from the changeover contact (normally open contact) must be connected. At breaker contacts, a maximum of 10 valve actuators can be connected and at normally open contacts a maximum of 5 valve actuators.

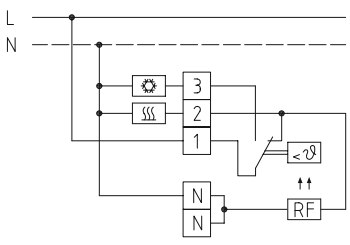
TECHNICAL DATA

Switching capacity: (Contact load)	230 V AC, 50 - 60 Hz heating: 10 mA...10 (4) A, DC 30 W cooling: 10 mA...5 (2) A
Sensor element:	bi-metal
Control range:	+5...+30 °C
Output:	breaker or changeover contact
Operating difference:	approx. 0.5 K
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	75 x 75 x 25 mm (E1)
Electrical connection:	0.14 - 2.5 mm^2 via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	II (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

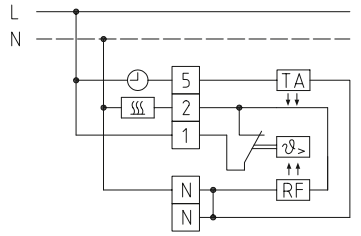
Connecting diagram **RTR - B 121**



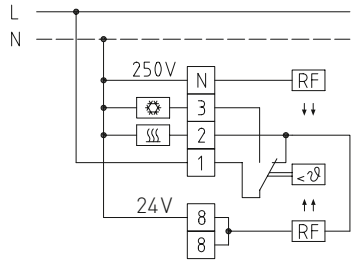
Connecting diagram **RTR - B 721**



Connecting diagram **RTR - B 124**

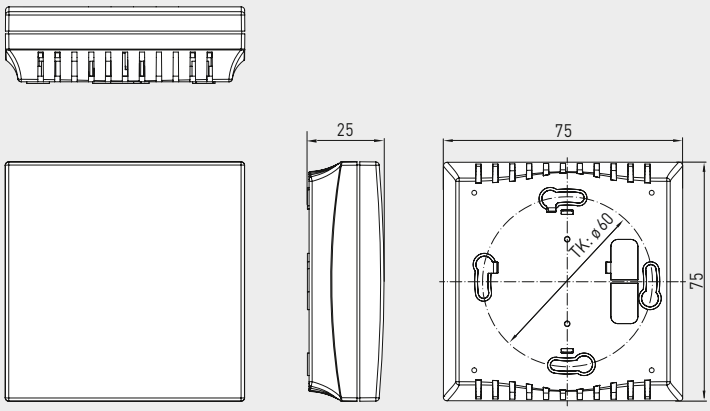


Connecting diagram **RTR - B 747**



Dimensional drawing

Housing **E 1**
(Picture similar)

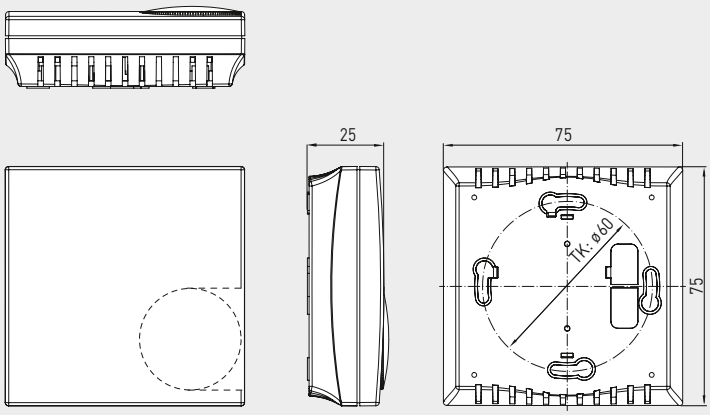


RTR-B 747
with internal setting



Dimensional drawing

Housing **E 1**
with one potentiometer
(Picture similar)



RTR-B 121
RTR-B 124
RTR-B 721
with external setting



THERMASREG® RTR - B Room temperature controllers

Type / WG01	Temperature Range	Function	Output	Item No.	Price
RTR-B 121 / B 124 / B 721				**External setting**	
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000	**38,92 €**
RTR-B 124	+5...+30 °C	Heating, temperature reduction - 5 K	Breaker	1102-4011-2400-000	**41,14 €**
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000	**42,84 €**
RTR-B 747				**Internal setting**	
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000	**46,73 €**

THERMASREG® TR 040
THERMASREG® TR 060

Temperature controllers, one-step, with switching output

S+S REGELTECHNIK

Mechanical temperature controllers / wet room temperature controllers **THERM**ASREG® **TR 040 / TR 060** with switching output (one-step) and stainless steel capillary (spiral coil sensor), working without external voltage. They are used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 040
TR 060
(one-step)
TR



TR 040 U
TR 060 U
(one-step)
TW



TECHNICAL DATA

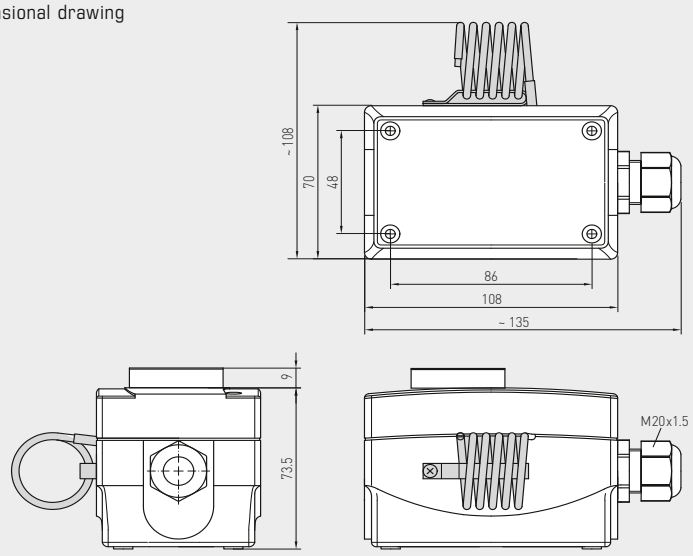
Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–35…+65 °C
Capillary:	stainless steel **V2A** (1.4303)
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K; at +20°C ± 1K
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

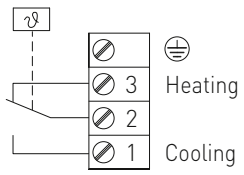
Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating. The switch-on value is lower by the amount of operating difference. Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling. The switch-off value is lower by the amount of operating difference. Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing — **TR 040** **TR 060**



Connecting diagram — **TR 040** **TR 060**



THERMASREG® TR 040 / TR 060 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TR 040 / 060				**TR** (External setting)	
TR-040	0…+40 °C	2 K	+65 °C	1102-1050-1100-200	**81,11 €**
TR-060	0…+60 °C	2 K	+75 °C	1102-1050-1100-300	**81,11 €**
TR 040 U / 060 U				**TW** (Internal setting)	
TR-040 U	0…+40 °C	2 K	+65 °C	1102-1050-2100-200	**79,80 €**
TR-060 U	0…+60 °C	2 K	+75 °C	1102-1050-2100-300	**79,80 €**

Mechanical temperature controller / wet room temperature controller **THERM**ASREG® **TR 22** with switching output (one-step) and copper capillary, working without external voltage.
It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 22
(one-step)
TR



TR 22 U
(one-step)
TW



TECHNICAL DATA

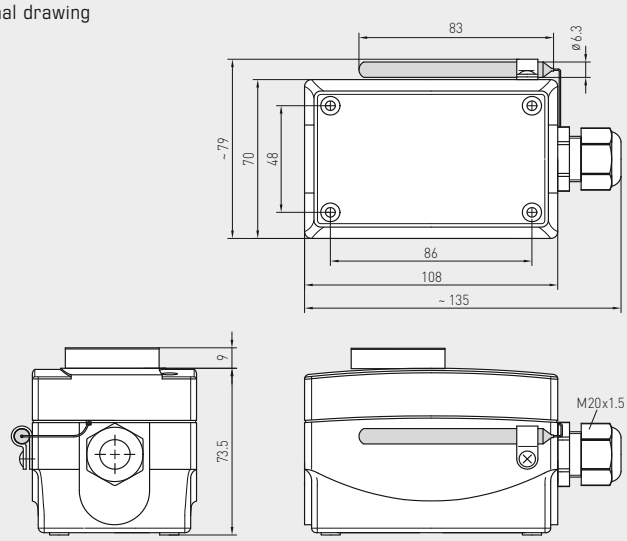
Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–35...+65 °C
Design principle:	torsion meter with liquid filling
Capillary:	copper
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K
Routing:	admissible vibration load ≤ ½g
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

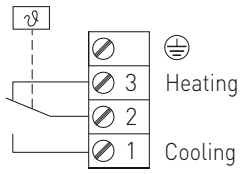
Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating.
The switch-on value is lower by the amount of operating difference.
Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.
The switch-off value is lower by the amount of operating difference.
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing **TR 22**



Connecting diagram **TR 22**



THERMASREG® TR 22 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TR 22				**TR** (External setting)	
TR-22	–35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-1100-100	**81,11 €**
TR 22 U				**TW** (Internal setting)	
TR-22 U	–35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-2100-100	**79,80 €**

Temperature controllers, two-step, with switching output

S+S REGELTECHNIK

Mechanical temperature controller / wet room temperature controller **THERM**ASREG® **TR 04040** with two independently switching outputs, which are separately adjustable (e.g. for switching between day and night time) and stainless steel capillary (spiral coil sensor), working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TR 04040



TR 04040 U



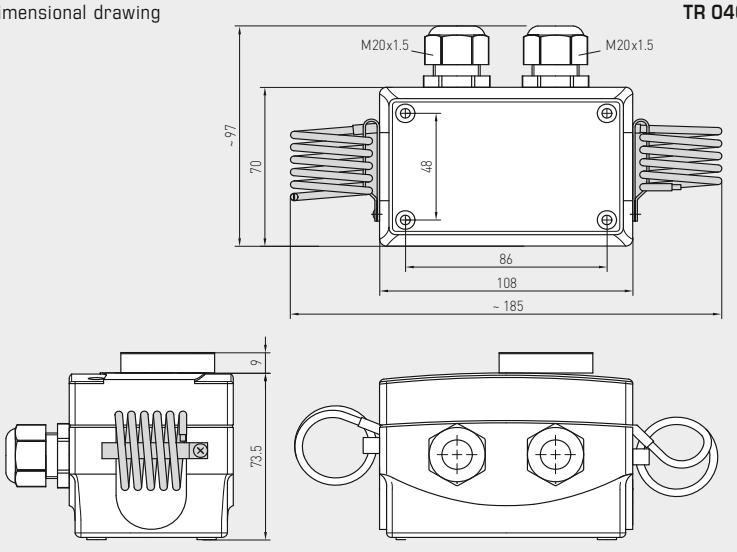
TECHNICAL DATA

Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact (two changeover contacts, separately adjustable)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	2x M 20 x 1.5; including strain relief
Housing temperature:	–10…+65 °C
Capillary:	stainless steel **V2A** (1.4303)
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K; at +20 °C ± 1K
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

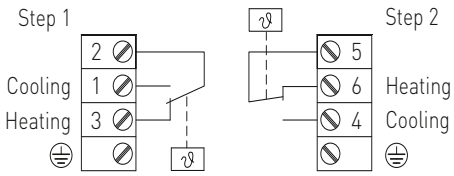
FUNCTION

Heating: Contacts 2 - 3 and 5 - 6 break when temperature rises to the preset value.
Cooling: Contacts 2 - 1 and 5 - 4 break when temperature drops to the preset value.

Dimensional drawing **TR 04040**



Connecting diagram **TR 04040**



THERMASREG® **TR 04040** Temperature controllers, two-step

Type / WG01	Temperature Range (adjustable) 1.	2.	Thermal Operating Difference (fixed) approx. 1.	2.	Max. Capillary Temperature	Item No.	Price
TR 04040						**TR + TW** (External / Internal setting)	
TR-04040	0…+40 °C	0…+40 °C	2 K	2K	+65 °C	1102-1050-1200-200	**119,32 €**
TR 04040 U						**TW + TW** (Internal setting)	
TR-04040 U	0…+40 °C	0…+40 °C	2 K	2K	+65 °C	1102-1050-2200-200	**119,32 €**

Mechanical temperature controller **THERM**ASREG® **TR xx - F** with remote sensor and switching output (one-step), working as capillary thermostat / capillary controller without external voltage. This capillary controller is used for monitoring and to control temperatures of non-aggressive liquid or gaseous media in heating, ventilation and air conditioning technology as well as in mechanical and apparatus engineering, for installation in immersion sleeves or air conditioning ducts.

TRxx-F



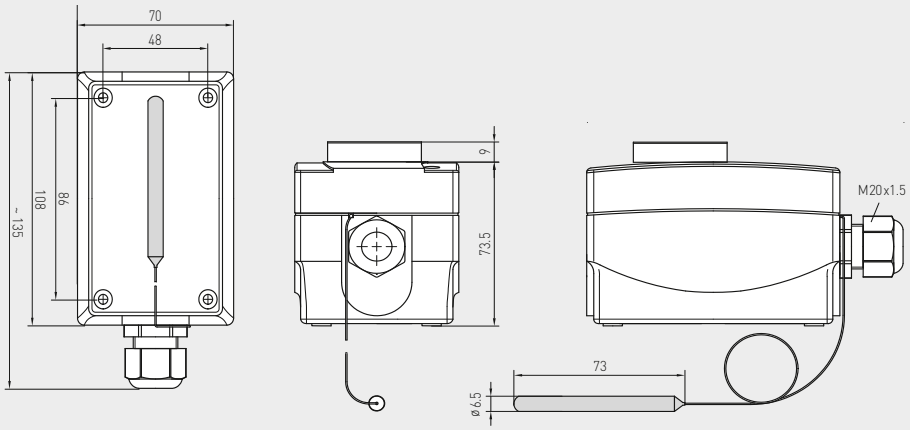
TRxx-F-U



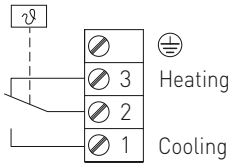
TECHNICAL DATA

Switching capacity: (Contact load)	24…250 V AC +10 %, 16 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–10...+65 °C
Design principle:	torsion meter with liquid filling
Sensor:	copper tube, length of capillary = 1 m with PVC protective hose, Ø 6.8 mm
Tolerance:	T_{min} ± 3 K; T_{max} ± 3 K
Inserted length:	immersion sleeves EL = 150 mm (accessories see table)
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	**Heating:** wire contacts 2 - 3 **Cooling:** wire contacts 2 - 1

Dimensional drawing **TRxx-F**



Connecting diagram **TRxx-F**



THERMASREG® TR xx - F Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TRxx-F				**TR** (External setting)	
TR-1-F	–35… +35 °C	3 K (± 1 K)	+60 °C	1102-1056-1110-100	**82,20 €**
TR-060-F	0… +60 °C	3 K (± 1 K)	+75 °C	1102-1050-1110-300	**82,20 €**
TR-090-F	0… +90 °C	3 K (± 1 K)	+120 °C	1102-1050-1110-400	**82,20 €**
TR-0120-F	0...+120 °C	5 K (± 1 K)	+135 °C	1102-1050-1110-500	**82,20 €**
TR-50140-F	+50...+140 °C	5 K (± 1 K)	+150 °C	1102-1050-1110-600	**82,20 €**
Extra charge:	**U** = Internal setting (**TW**), e. g. TR - 090 - F - U				**10,25 €**
ACCESSORIES					
THR-MS-08/150	Brass immersion sleeve, EL = 150 mm, Ø 8 x 0.5 mm			7100-0011-3404-000	**16,02 €**
THR-VA-09/150	Stainless steel immersion sleeve **V2A** (1.4301), EL = 150 mm, Ø 9 x 1.0 mm			7100-0012-3032-000	**42,22 €**
	For further information, see the last chapter!				

**Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output**

S+S REGELTECHNIK

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014 / 68 / EU.

Mechanical temperature control device / rod thermostat **THERM**ASREG® **ETR** with switching output, used for monitoring, controlling or limiting the temperatures of liquid or gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller **TR**, temperature monitor **TW**, or as safety temperature limiter **STB**.





TECHNICAL DATA

Switching capacity: (Contact load)	24 ... 250 V AC + 10 %, 10 A, cos φ = 1.0 24 ... 250 V AC + 10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	–10...+65 °C at the switch block housing
Tolerance:	T_{min} ± 5 K; T_{max} ± 3 K
Immersion sleeves:	**THR-ms-08 / xx**, Single sleeve brass, nickel-plated, Ø = 8 mm, R ½" straight pipe thread, wrench size 22, p_{max} = 10 bar, T_{max} = +150 °C **THR-VA-09 / xx**, Single sleeve stainless steel **V4A** (1.4571), Ø = 9 mm, G ½" straight pipe thread, wrench size 22, p_{max} = 25 bar, T_{max} = +150 °C **THR-VA-17 / xx**, Double sleeve stainless steel **V4A** (1.4571), Ø = 17 mm, G ½" straight pipe thread, wrench size 22, p_{max} = 25 bar, T_{max} = +150 °C (Depending on the type, the relevant immersion sleeve is included in the scope of delivery, see table)
Operating medium:	Water, oil, air and exhaust gas
Inserted length:	100 mm / 150 mm / 200 mm (see table)
Process connection:	screwed socket
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
Tests:	**EC type test (module B) according to directive 2014 / 68 / EU,** certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: **STB 1201, TR / STB 1202**
FUNCTION	**TW, TR:** Contact 2-3 breaks when temperature rises to the preset value. **STB:** Contact 2-1 or 5-4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.

Equipment sensor / controller, including immersion sleeve, EC type-tested, TÜV tested, with switching output

Configuration variants:

TW
Temperature monitor
(internal setting)

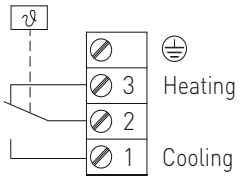
TR
Temperature controller
(external setting)

STB
Safety temperature limiter
(internal setting)

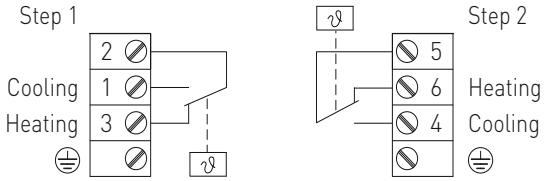
TW+TW
Double temperature monitor
(internal setting)

TR + STB
Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)

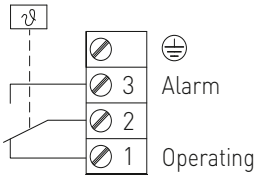
Connecting diagram **TW, TR** **ETR** (one-step)



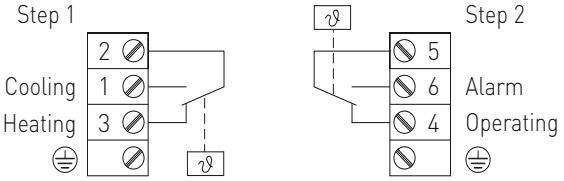
Connecting diagram **TW+TW** **ETR** (two-step)



Connecting diagram **STB** **ETR** (one-step)



Connecting diagram **TR + STB** **ETR** (two-step)





ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

CERTIFICATE

valid until: 25.02.2028

ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.:	Z-IS-TAF-MUC-18-03-2652130-002
Name and address of manufacturer:	S+S Regeltechnik GmbH Pirnaer Str. 20 90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Evaluation report No.:	C-T 1382-01/18 dated 2018-02-26
Scope of examination:	Safety temperature limiter as safety accessory type: ETR and KTR (see page 3) basis of examination and details see page 3
Manufacturing plant:	S+S Regeltechnik GmbH Pirnaer Str. 20 90411 Nürnberg

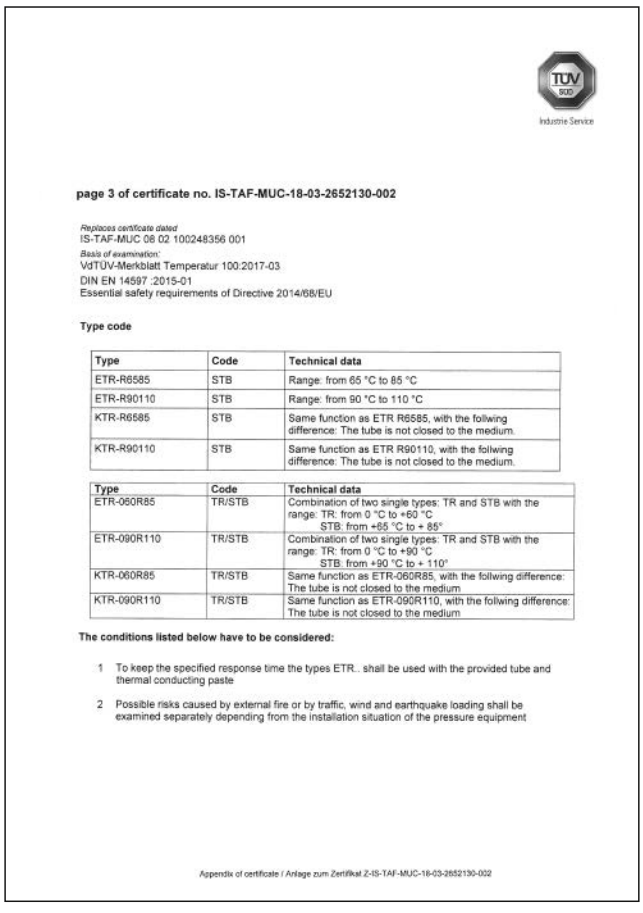
München, 26.02.2018
(Place, date)

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment
Johannes Steiglechner

Notified Body No. 0036
TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV®



TÜV SÜD Industrie Service

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
IS-TAF-MUC 06 02 100248356 001

Basis of examination:
VdTÜV-Merkblatt Temperatur 100:2017-03
DIN EN 14597 :2015-01
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the follwing difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the follwing difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the follwing difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the follwing difference: The tube is not closed to the medium

The conditions listed below have to be considered:

1 To keep the specified response time the types ETR.. shall be used with the provided tube and thermal conducting paste

2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

THERMASREG® ETR

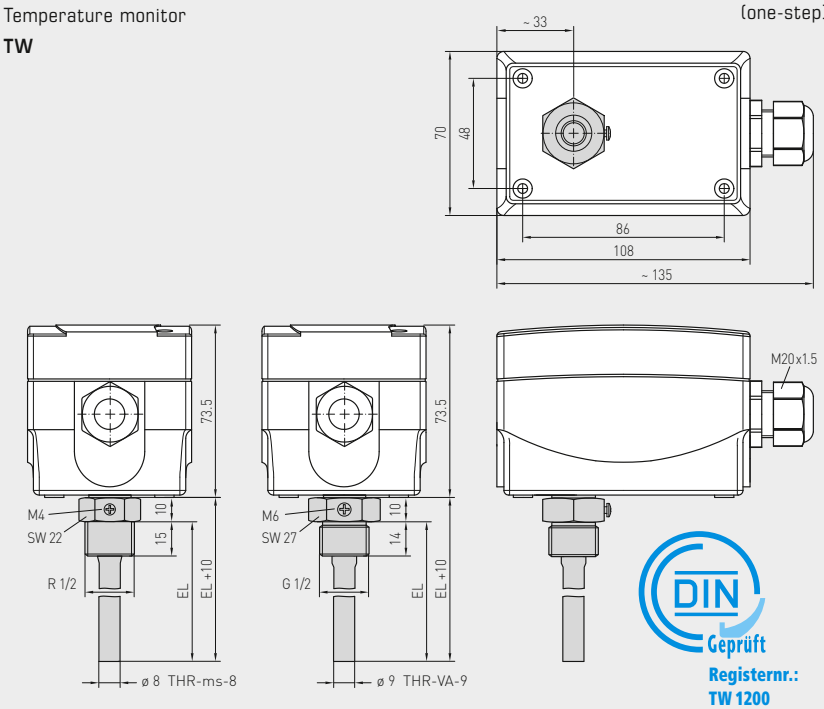
one-step

Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

S+S REGELTECHNIK

Dimensional drawing
Temperature monitor
TW

ETR-xxU
(one-step)



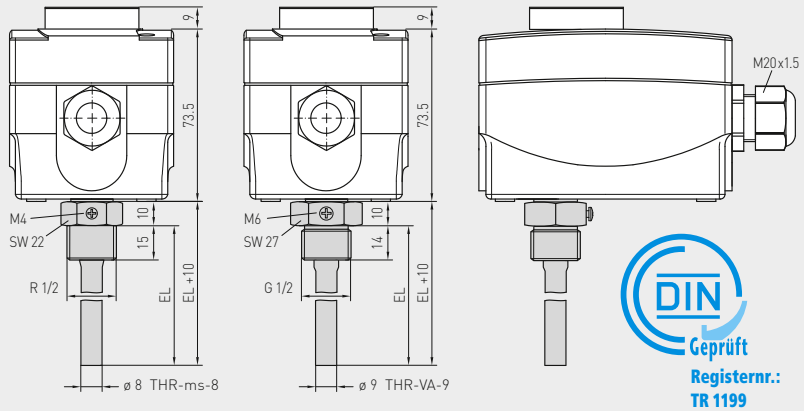
DIN Geprüft
Registernr.:
TW 1200



ETR-060U
ETR-090U
(one-step)
TW

Dimensional drawing
Temperature controller
TR

ETR-xx
(one-step)



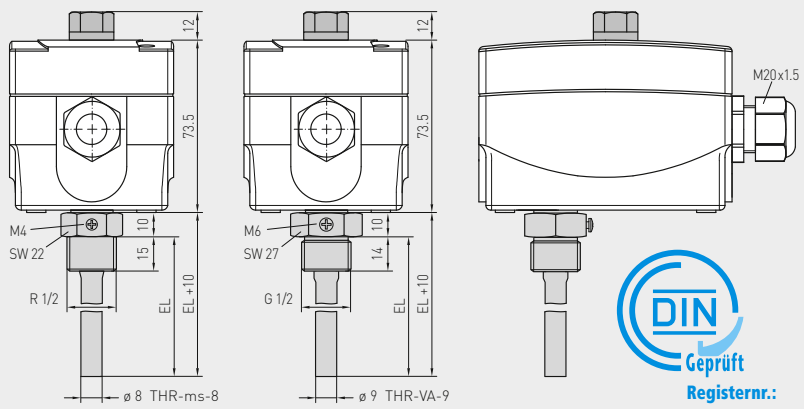
DIN Geprüft
Registernr.:
TR 1199



ETR-1
ETR-060
ETR-090
ETR-0120
ETR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter
STB

ETR-Rxx
(one-step)



DIN Geprüft
Registernr.:
STB 1201



ETR-R6585
ETR-R90110
(one-step)
STB
selectable

THERMASREG® ETR	Equipment sensor / controller, one-step, including immersion sleeve					
Type / WG02	**Inserted Length (EL)**	**Temperature Ranges (adjustable)**	**Thermal Operating Difference (fixed) approx.**	**Maximum Capillary Temp.**	**Item No.**	**Price**
ETR-060 U					**TW**	
ETR-060 U MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-380	**72,95 €**
ETR-060 U MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-310	**75,41 €**
ETR-060 U MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-320	**79,72 €**
ETR-060 U VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-390	**101,41 €**
ETR-060 U VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-330	**103,84 €**
ETR-060 U VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-340	**108,18 €**
ETR-090 U					**TW**	
ETR-090 U MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-480	**72,95 €**
ETR-090 U MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-410	**75,41 €**
ETR-090 U MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-420	**79,72 €**
ETR-090 U VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-490	**101,41 €**
ETR-090 U VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-430	**103,84 €**
ETR-090 U VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-440	**108,18 €**
ETR-1					**TR**	
ETR-1 MS/100	100 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-180	**72,95 €**
ETR-1 MS/150	150 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-110	**75,41 €**
ETR-1 MS/200	200 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-120	**79,72 €**
ETR-1 VA/100	100 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-190	**101,41 €**
ETR-1 VA/150	150 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-130	**103,84 €**
ETR-1 VA/200	200 mm	–35...+35 °C	3 K	+75 °C	1102-2010-1100-140	**108,18 €**
ETR-060					**TR**	
ETR-060 MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-380	**72,95 €**
ETR-060 MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-310	**75,41 €**
ETR-060 MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-320	**79,72 €**
ETR-060 VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-390	**101,41 €**
ETR-060 VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-330	**103,84 €**
ETR-060 VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-340	**108,18 €**
ETR-090					**TR**	
ETR-090 MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-480	**72,95 €**
ETR-090 MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-410	**75,41 €**
ETR-090 MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-420	**79,72 €**
ETR-090 VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-490	**101,41 €**
ETR-090 VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-430	**103,84 €**
ETR-090 VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-440	**108,18 €**
ETR-0120					**TR**	
ETR-0120 MS/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-580	**72,95 €**
ETR-0120 MS/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-510	**75,41 €**
ETR-0120 MS/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-520	**79,72 €**
ETR-0120 VA/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-590	**101,41 €**
ETR-0120 VA/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-530	**103,84 €**
ETR-0120 VA/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-540	**108,18 €**
ETR-50140					**TR**	
ETR-50140 MS/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-680	**72,95 €**
ETR-50140 MS/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-610	**75,41 €**
ETR-50140 MS/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-620	**79,72 €**
ETR-50140 VA/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-690	**101,41 €**
ETR-50140 VA/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-630	**103,84 €**
ETR-50140 VA/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-640	**108,18 €**
ETR-R6585					**STB**	
ETR-R6585 MS/100	100 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-780	**87,91 €**
ETR-R6585 MS/150	150 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-710	**90,36 €**
ETR-R6585 MS/200	200 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-720	**98,61 €**
ETR-R6585 VA/100	100 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-790	**106,51 €**
ETR-R6585 VA/150	150 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-730	**108,95 €**
ETR-R6585 VA/200	200 mm	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-740	**113,42 €**
ETR-R90110					**STB**	
ETR-R90110 MS/100	100 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-880	**87,91 €**
ETR-R90110 MS/150	150 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-810	**90,36 €**
ETR-R90110 MS/200	200 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-820	**98,61 €**
ETR-R90110 VA/100	100 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-890	**106,51 €**
ETR-R90110 VA/150	150 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-830	**108,95 €**
ETR-R90110 VA/200	200 mm	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-2010-6100-840	**113,42 €**

Type designation: **ETR-xx_immersion sleeve material / inserted length (mm)**
MS = Brass nickel-plated, **VA** = Stainless steel V4A (1.4571)

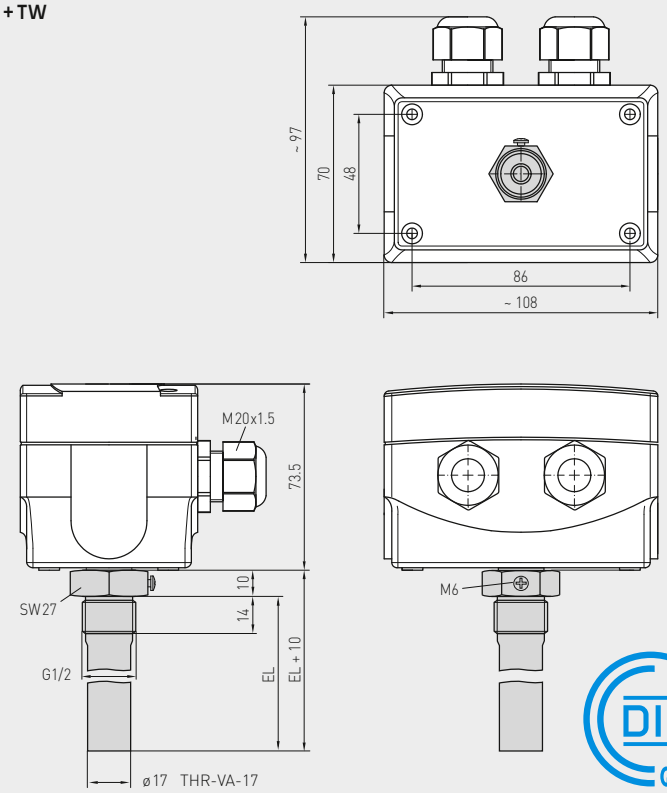
For further information and accessories see next page...

**Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output**

S+S REGELTECHNIK

Dimensional drawing
Double temperature monitor
TW + TW

ETR-xxU
(two-step)



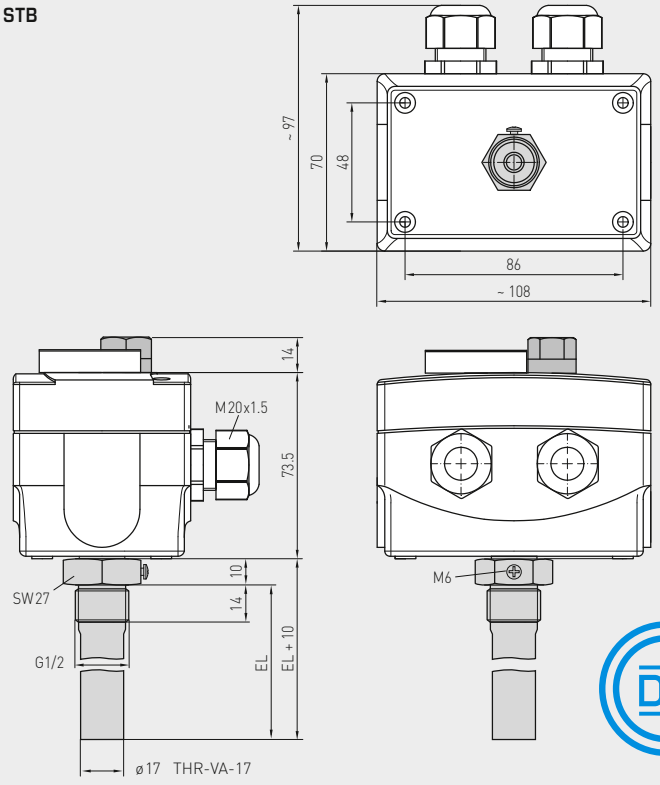
DIN Geprüft
Registernr.: TW / TW 1241



ETR-090090 U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

ETR-xxRxx
(two-step)



DIN Geprüft
Registernr.: TR / STB 1202



ETR-060R85
ETR-090R110
(two-step)
TR + STB
selectable

THERMASREG® ETR Equipment sensor / controller, two-step, including immersion sleeve

Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable) 1.	2.	Thermal Operating Difference (fixed) approx. 1.	2.	Maximum Capillary Temp.	Item No.	Price
ETR-090090 U							**TW + TW**	
ETR-090090 U VA/150	**150 mm**	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-2010-2205-130	**150,80 €**
ETR-090090 U VA/200	**200 mm**	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-2010-2205-140	**163,91 €**
ETR-060 R 85							**TR + STB**	
ETR-060R85 VA/150	**150 mm**	0...+60 °C	+65...+85 °C	3 K	+0 / –15...20 K	+120 °C	1102-2010-7205-230	**150,80 €**
ETR-060R85 VA/200	**200 mm**	0...+60 °C	+65...+85 °C	3 K	+0 / –15...20 K	+120 °C	1102-2010-7205-240	**163,91 €**
ETR-090 R110							**TR + STB**	
ETR-090R110 VA/150	**150 mm**	0...+90 °C	+90...+110 °C	3 K	+0 / –15...20 K	+135 °C	1102-2010-7205-330	**150,80 €**
ETR-090R110 VA/200	**200 mm**	0...+90 °C	+90...+110 °C	3 K	+0 / –15...20 K	+135 °C	1102-2010-7205-340	**163,91 €**

Type designation:	**ETR-xx_immersion sleeve material / inserted length (mm)** **MS** = Brass nickel-plated, **VA** = Stainless steel V4A (1.4571)	
Extra charge:	**U** = Internal setting, unless included in a certain type **/2** = 2 steps, unless included in a certain type	**10,25 €** on request
Features:	**TR** = Temperature controller (**external setting**) **TW** = Temperature monitor (**internal setting**) **STB** = Safety temperature limiter (**internal setting**), **selectable,** with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+0 K / - 15...20 K); **with EC type test (module B) according to directive 2014 / 68 / EU**	
Note:	To ensure **accurate responsiveness** series **ETR** devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste	

ACCESSORIES

WLP-1	**Heat-conductive paste**, silicone-free	7100-0060-1000-000	**3,48 €**
	For further information see last chapter!		

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm

Type / WG01	p_{max} (static)	T_{max}	Time Constant for Medium: Air	Water	Oil	Inserted Length (EL)	Item No. Ø	Price
THR-ms-08 / xx	**Brass nickel-plated**						**Ø 8** x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	**100 mm**	7100-0011-3022-000	**15,88 €**
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	**150 mm**	7100-0011-3404-000	**16,02 €**
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	**200 mm**	7100-0011-3403-000	**19,02 €**
THR-VA-09 / xx	**Stainless steel V4A** (1.4571)						**Ø 9** x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	**100 mm**	7100-0012-3022-000	**40,91 €**
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	**150 mm**	7100-0012-3032-000	**42,22 €**
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	**200 mm**	7100-0012-3042-000	**45,24 €**
THR-VA-17 / xx	**Stainless steel V4A** (1.4571)						**Ø 17** x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	**150 mm**	7100-0012-3033-000	**42,22 €**
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	**200 mm**	7100-0012-3404-000	**45,24 €**

Ordering example:	THR-ms-08 / **100**	(Brass immersion sleeve, Ø = 8 mm, **EL = 100** mm)
	THR-VA-09 / **150**	(Stainless steel immersion sleeve, Ø = 9 mm, **EL = 150** mm)
	THR-VA-17 / **200**	(Stainless steel immersion sleeve, Ø = 17 mm, **EL = 200** mm)
Note:	inner diameter of socket 15.0 mm	

THERMASREG® KTR

**Duct temperature controllers, including mounting flange,
EC type-tested, TÜV tested,
with switching output**

S+S REGELTECHNIK

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014/68/EU.

Mechanical temperature control device / rod thermostat **THERM**ASREG® **KTR** with switching output, used for monitoring, controlling or limiting the temperatures of gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller **TR**, temperature monitor **TW**, or as safety temperature limiter **STB**.





TECHNICAL DATA

Switching capacity: (Contact load)	24…250 V AC +10 %, 10 A, cos φ = 1.0 24…250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	–10…+65 °C at the switch block housing
Tolerance:	T_{min} ± 5 K; T_{max} ± 3 K
Operating medium:	Air
Protective tube:	**metal,** material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Inserted length:	approx. 205 mm (with flange); approx. 184 mm (without flange)
Process connection:	by mounting flange (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	**EC type test (module B) according to directive 2014/68/EU,** certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: **STB 1201, TR/STB 1202**
FUNCTION	**TW, TR:** Contact 2-3 breaks when temperature rises to the preset value. **STB:** Contact 2-1 or 5-4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.

Configuration variants:

TW
Temperature monitor
(internal setting)

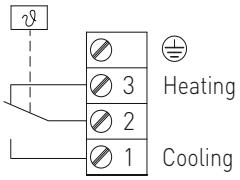
TR
Temperature controller
(external setting)

STB
Safety temperature limiter
(internal setting)

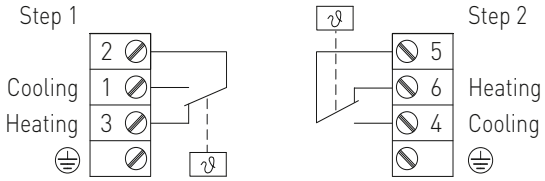
TW+TW
Double temperature monitor
(internal setting)

TR + STB
Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)

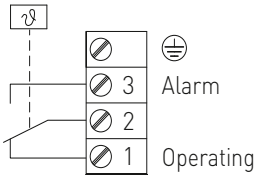
Connecting diagram **KTR**
TW, TR (one-step)



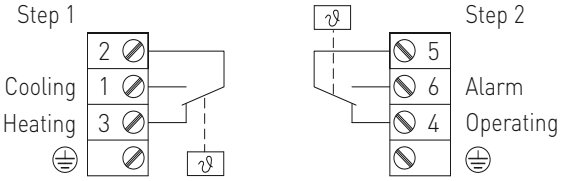
Connecting diagram **KTR**
TW+TW (two-step)



Connecting diagram **KTR**
STB (one-step)



Connecting diagram **KTR**
TR + STB (two-step)





ZERTIFIKAT ◆ CERTIFICATE ◆ 證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

CERTIFICATE

valid until: 25.02.2028

ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.:	Z-IS-TAF-MUC-18-03-2652130-002
Name and address of manufacturer:	S+S Regeltechnik GmbH Pirnaer Str. 20 90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Evaluation report No.:	C-T 1382-01/18 dated 2018-02-26
Scope of examination:	Safety temperature limiter as safety accessory type: ETR and KTR (see page 3) basis of examination and details see page 3
Manufacturing plant:	S+S Regeltechnik GmbH Pirnaer Str. 20 90411 Nürnberg

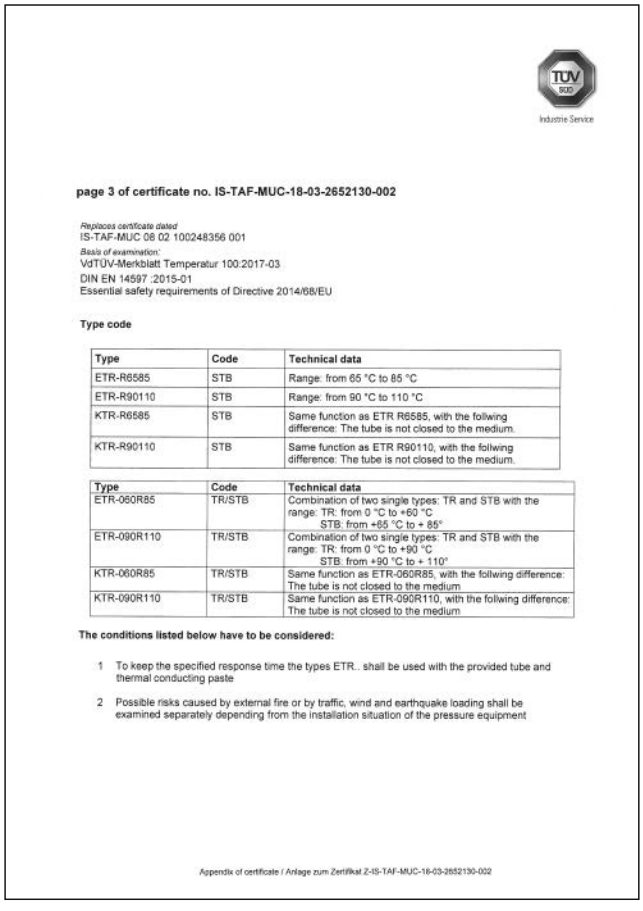
München, 26.02.2018
(Place, date)

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment
Johannes Steiglechner

Notified Body No. 0036
TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV



TÜV SÜD Industrie Service

page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated
IS-TAF-MUC 06 02 100248356 001

Basis of examination:
VdTÜV-Merkblatt Temperatur 100:2017-03
DIN EN 14597 :2015-01
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the follwing difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the follwing difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to + 85°
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to + 110°
KTR-060R85	TR/STB	Same function as ETR-060R85, with the follwing difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the follwing difference: The tube is not closed to the medium

The conditions listed below have to be considered:

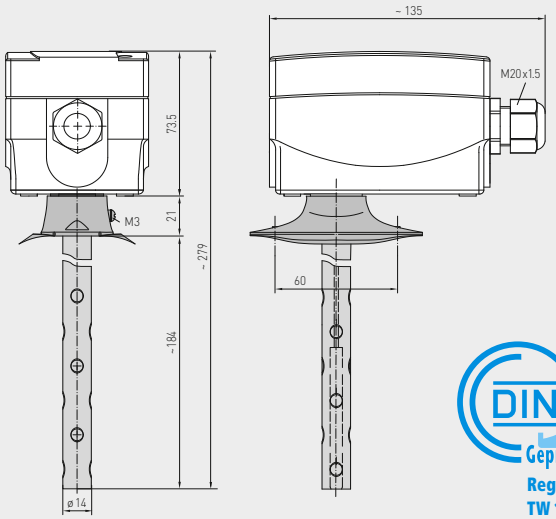
1 To keep the specified response time the types ETR.. shall be used with the provided tube and thermal conducting paste

2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing
Temperature monitor
TW

KTR-xxU
(one-step)



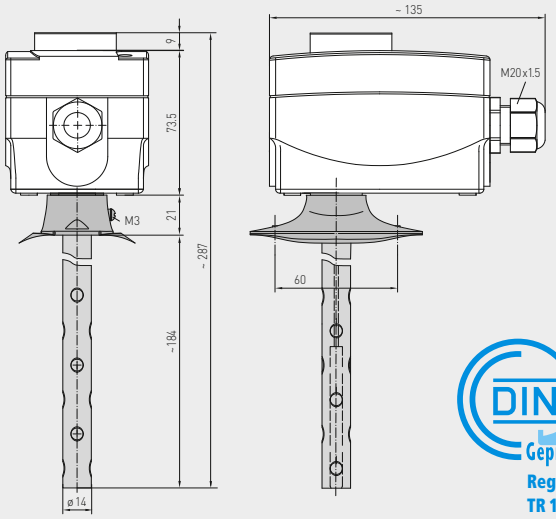
DIN Geprüft
Registernr.:
TW 1200



KTR-060U
KTR-090U
(one-step)
TW

Dimensional drawing
Temperature controller
TR

KTR-xx
(one-step)



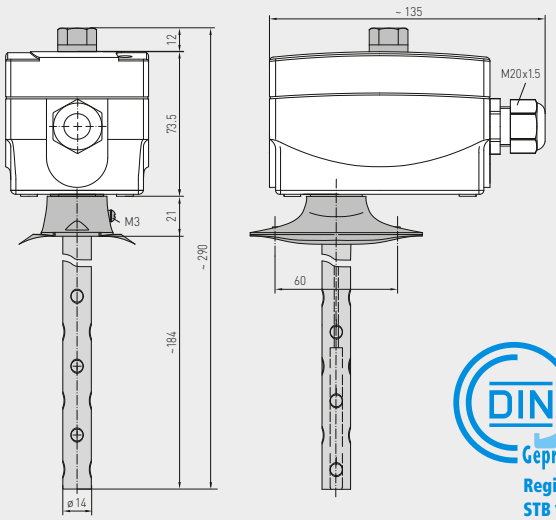
DIN Geprüft
Registernr.:
TR 1199



KTR-1
KTR-060
KTR-090
KTR-0120
KTR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter
STB

KTR-Rxx
(one-step)



DIN Geprüft
Registernr.:
STB 1201



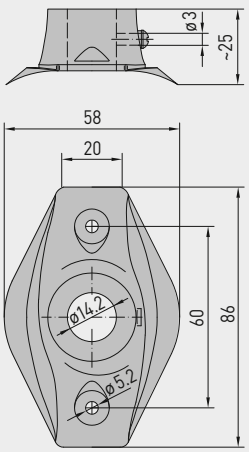
KTR-R6585
KTR-R90110
(one-step)
STB
adjustable

THERMASREG® KTR	Duct temperature controllers, one-step					
Type / WG02	**Ø mm**	**Temperature Ranges (adjustable)**	**Thermal Operating Difference (fixed) approx.**	**Maximum Capillary Temp.**	**Item No.**	**Price**
KTR-060 U / 090 U					**TW**	
KTR-060 U	14	0...+60 °C	3 K	+75 °C	1102-3010-2100-350	**78,80 €**
KTR-090 U	14	0...+90 °C	3 K	+120 °C	1102-3010-2100-450	**78,80 €**
KTR-xx					**TR**	
KTR-1	14	–35...+35 °C	3 K	+75 °C	1102-3010-1100-150	**78,80 €**
KTR-060	14	0...+60 °C	3 K	+75 °C	1102-3010-1100-350	**78,80 €**
KTR-090	14	0...+90 °C	3 K	+120 °C	1102-3010-1100-450	**78,80 €**
KTR-0120	14	0...+120 °C	5 K	+135 °C	1102-3010-1100-550	**78,80 €**
KTR-50140	14	+50...+140 °C	5 K	+150 °C	1102-3010-1100-650	**78,80 €**
KTR-R6585 / R90110					**STB**	
KTR-R6585	14	+65...+85 °C	+0 / –15...20 K	+120 °C	1102-3010-6100-750	**93,42 €**
KTR-R90110	14	+90...+110 °C	+0 / –15...20 K	+120 °C	1102-3010-6100-850	**93,42 €**

Extra charge:	**U** = Internal setting, unless included in a certain type **/2** = 2 steps, unless included in a certain type	on request	**10,25 €**
Equipment:	**FT** = Manual reset when temperature drops **ST** = Manual reset when temperature rises **TR** = Temperature controller (**external setting**) **TB** = Temperature limiter (**internal setting**) **TW** = Temperature monitor (**internal setting**) **STB** = Safety temperature limiter (**internal setting**), **selectable,** with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) **with EC type test (module B) according to directive 2014 / 68 / EU**		

ACCESSORIES			
MF-14-K	**Mounting flange**, plastic	7100-0030-2000-000	**9,85 €**
	For further information see last chapter!		

Dimensional drawing **MF-14-K**



MF-14-K

Mounting flange,
plastic

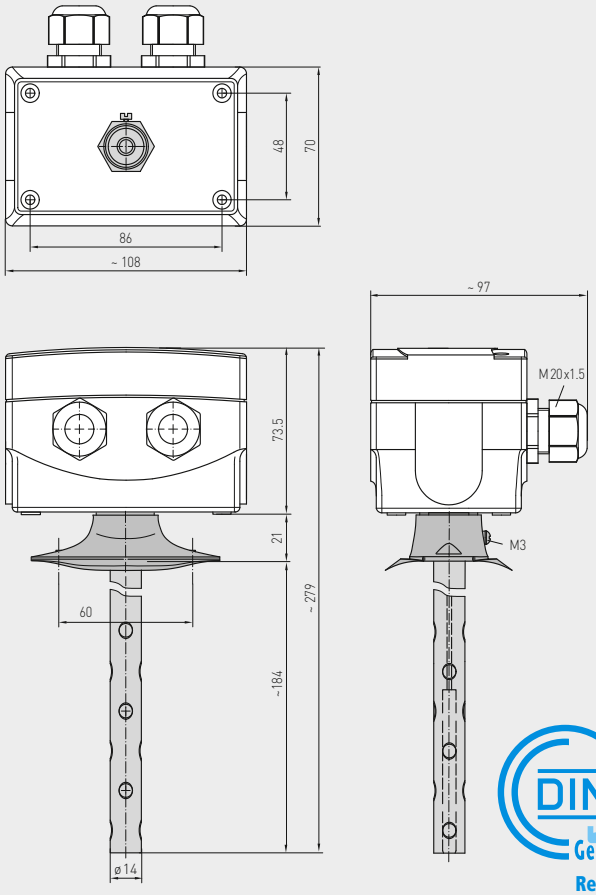


**Duct temperature controllers, including mounting flange,
EC type-tested, TÜV tested,
with switching output**

S+S REGELTECHNIK

Dimensional drawing
Double temperature monitor
TW + TW

KTR-xx U
(two-step)



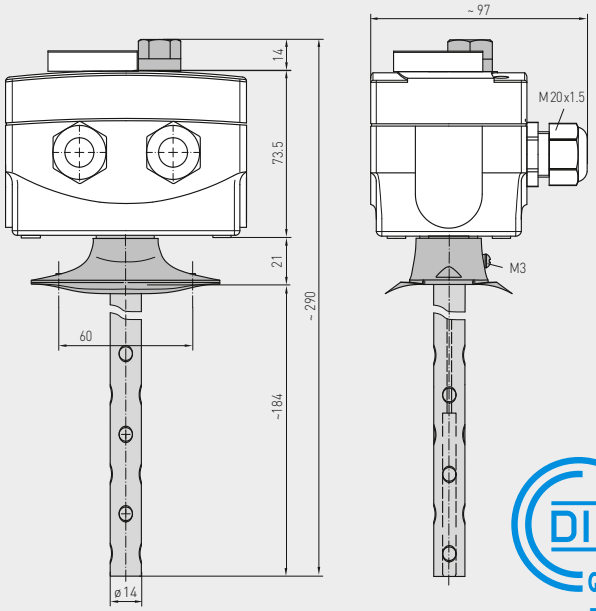
Registernr.:
TW / TW 1241



KTR-090090 U
(two-step)
TW + TW

Dimensional drawing
Temperature controller +
safety temperature limiter
TR + STB

KTR-xx R xx
(two-step)



Registernr.:
TR / STB 1202



KTR-060 R 85
KTR-090 R 110
(two-step)
TR + STB
adjustable

THERMASREG® KTR Duct temperature controllers, two-step

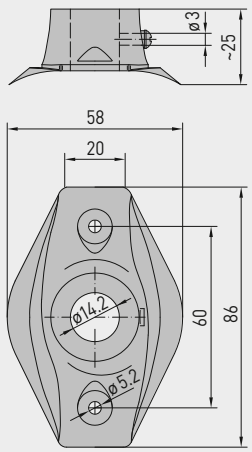
Type / WG02	Ø mm	Temperature Ranges (adjustable) 1.	2.	Thermal Operating Difference (fixed) approx. 1.	2.	Maximum Capillary Temp.	Item No.	Price
KTR-090090 U							**TW + TW**	
KTR-090090 U	14	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-3010-2205-150	**117,16 €**
KTR-060 R 85							**TR + STB**	
KTR-060R85	14	0...+60 °C	+65...+85 °C	3 K	+0 / –15...20 K	+120 °C	1102-3010-7205-250	**117,16 €**
KTR-090 R110							**TR + STB**	
KTR-090R110	14	0...+90 °C	+90...+110 °C	3 K	+0 / –15...20 K	+135 °C	1102-3010-7205-350	**117,16 €**

Extra charge:	**U** = Internal setting, unless included in a certain type **/2 = 2 steps, unless included in a certain type**	on request	**10,25 €**
Features:	**TR** = Temperature controller (**external setting**) **TW** = Temperature monitor (**internal setting**) **STB** = Safety temperature limiter (**internal setting**), **selectable,** with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) **with EC type test (module B) according to directive 2014 / 68 / EU**		

ACCESSORIES

MF-14-K	**Mounting flange**, plastic	7100-0030-2000-000	**9,85 €**
	For further information see last chapter!		

Dimensional drawing **MF-14-K**



MF-14-K

Mounting flange,
plastic



S+S REGELTECHNIK

Surface contact temperature controllers, including tension spring

Mechanical temperature controllers / contact thermostats **THERM**ASREG® **ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

ALTR 060 / 090



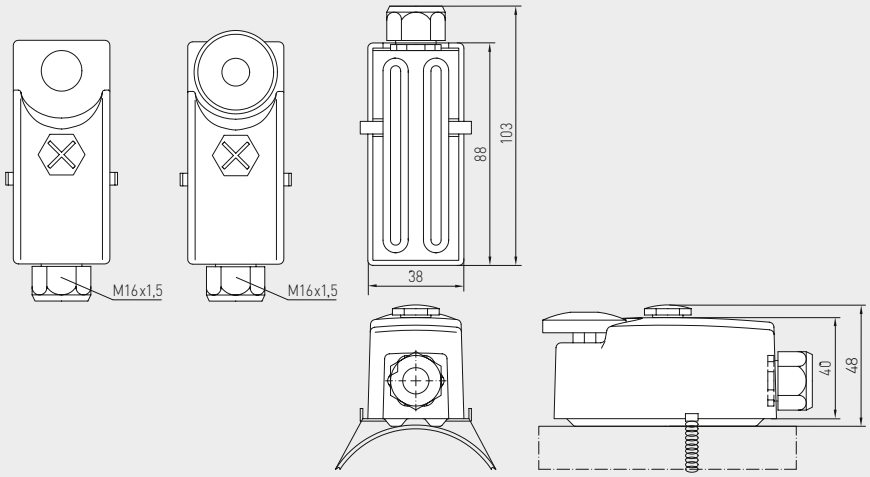
ALTR 060 / 090 U



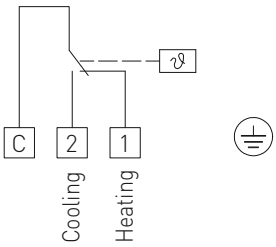
TECHNICAL DATA

Switching capacity: (Contact load)	16 (4) A; 24…250 V AC at 24 V AC min. 150 mA
Max. sensor temperature:	+110 °C
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: grey, M 16 x 1.5
Housing temperature:	–35…+65 °C
Tolerance:	T_{min} ± 5 K; T_{max} ± 5 K
Sensor element:	bi-metal
Housing dimensions:	38 x 48 x 103 mm
Process connection:	by metal tension spring, 220 mm long (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 40** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	**Heating:** wire contacts C - 1 **Cooling:** wire contacts C - 2

Dimensional drawing **ALTR 060 / 090**



Connecting diagram **ALTR 060 / 090**



THERMASREG® ALTR 060 / 090 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
ALTR 060 / 090				**TR** (External setting)	
ALTR-060	0…+60 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-300	**32,80 €**
ALTR-090	0…+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-400	**32,80 €**
ALTR 060 / 090 U				**TW** (Internal setting)	
ALTR-060 U	0…+60 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-300	**32,80 €**
ALTR-090 U	0…+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400	**32,80 €**

Mechanical temperature controllers / contact thermostats **THERM**ASREG® **ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

ALTR 1 / 3 / 5 / 7



ALTR 1 / 3 / 5 / 7 U



TECHNICAL DATA

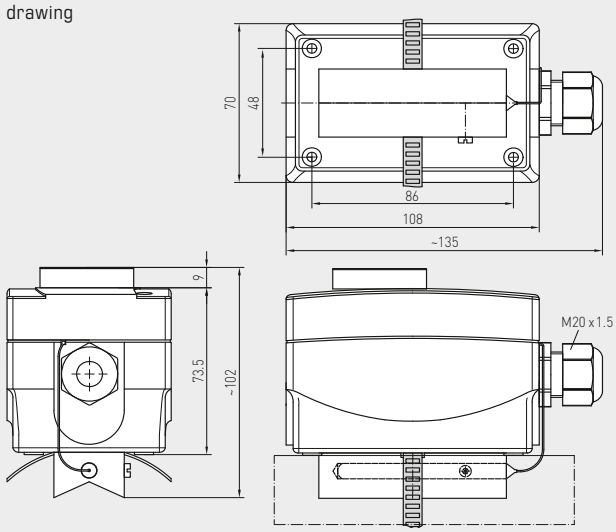
Switching capacity: (Contact load)	24 ... 250 V AC +10 %, 16 A, cos φ = 1.0 24 ... 250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; including strain relief
Housing temperature:	–35...+65 °C
Tolerance:	T_{min} ± 5 K; T_{max} ± 5 K
Design principle:	torsion meter with liquid filling
Process connection:	endless strap with metal tightener (included in the scope of delivery), Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

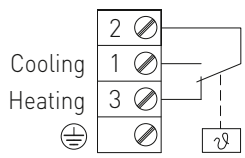
Heating: The preset setpoint (scale value) is equivalent to the switch-off value of the heating. The switch-on value is lower by the amount of operating difference. Contact 2 - 3 breaks when temperature rises to the preset value.

Cooling: The preset setpoint (scale value) is equivalent to the switch-on value of the cooling. The switch-off value is lower by the amount of operating difference. Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing **ALTR 1 / 3 / 5 / 7**



Connecting diagram **ALTR 1 / 3 / 5 / 7**



THERMASREG® ALTR 1 / 3 / 5 / 7 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
ALTR 1 / 3 / 5 / 7				**TR** (External setting)	
ALTR-1	–35... +35 °C	5 K (± 1 K)	+60 °C	1102-1030-1100-100	**103,70 €**
ALTR-3	0... +60 °C	5 K (± 1 K)	+75 °C	1102-1030-1100-300	**103,70 €**
ALTR-5	0... +90 °C	5 K (± 1 K)	+120 °C	1102-1030-1100-400	**103,70 €**
ALTR-7	0...+120 °C	5 K (± 1 K)	+130 °C	1102-1030-1100-500	**103,70 €**
Extra charge:	**U** = Internal setting (**TW**), e. g. ALTR - 1 U				**10,25 €**

S+S REGELTECHNIK

Frost protection thermostats, mechanical, one-step, with switching output

The mechanical frost protection thermostat / frost monitor **THERM**ASREG® **FST** with switching output, fully-active sensor rod, with automatic reset, or with mechanical locking and manual reset, is available with capillaries in lengths of 0.6 m, 1.8 m, 3 m, 6 m, or 12 m. This frost protection monitor is used for air- and water-side temperature monitoring at heat exchangers, water circulation systems, and heating registers to prevent freezing up and to avoid frost damages, e. g. in ventilation and air conditioning ducts. All devices are self-secure with sensor breakage detection. In case of damage to the capillary tube – membrane system, the relay automatically switches to heating function. **FST-3** can also be used for monitoring liquids. The sensor tube can be installed inside an immersion sleeve. Mounting clamps **MK-05-K** are included in the delivery.

FST-1D / 5D / 7D / 8D



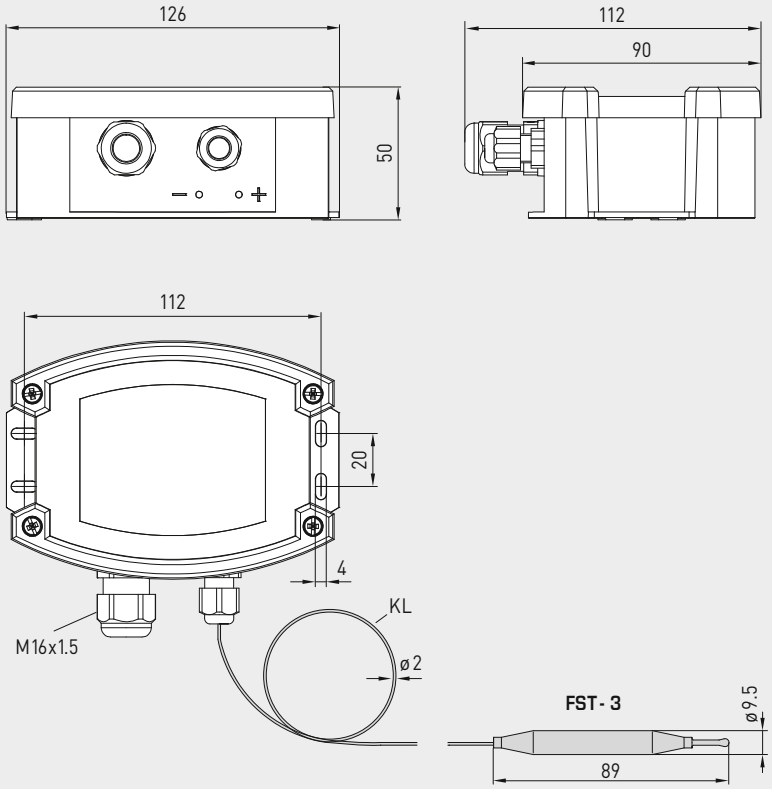
FST-3D



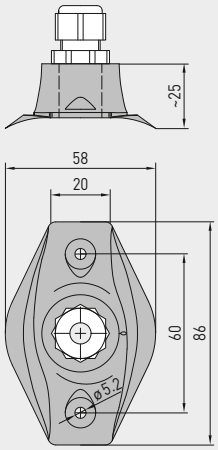
TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	–10...+15 °C / +14 °F...+59 °F, factory setting to w = +5 °C (+41 °F)
Operating difference:	2 ± 1 K (3.6 ± 1.8 °F)
Reproducibility:	± 0.5 K (± 0.9 °F)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Sensor responding length:	approx. 40 cm
Length of capillary tube:	see table of types (0.6...12 m)
Resetting:	**FST-xD** automatic **FST-xD-HR** manual
Permissible medium:	**FST-1D/5D/7D/8D** air **FST-3D** water
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: w+ min. +2 °C (min. +3.6 °F) storage / transport: –30...+70 °C (–22...+158 °F) capillary: max. +150 °C (+302 °F)
Process connection:	by mounting clamps **MK-05-K** (included in the scope of delivery)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable gland:	M 16 x 1.5; including strain relief
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Installation length:	arbitrary
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm²
Protection class:	I (according to EN 60 730-1)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	Contact C - 2: danger of frost / sensor breakage Contact C - 3: normal operation For further information see next page...
ACCESSORIES	see table

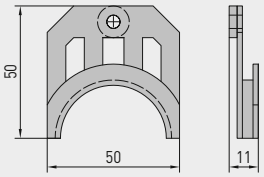
Dimensional drawing **FST**



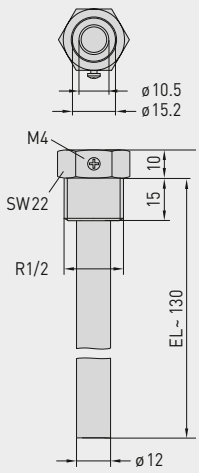
Dimensional drawing **KRD-04**



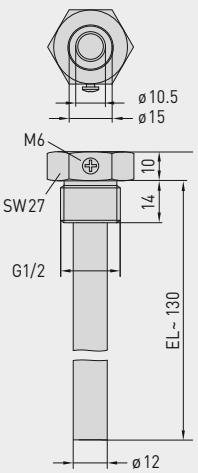
Dimensional drawing **MK-05-K**



Dimensional drawing **THR-ms-01**



Dimensional drawing **THR-VA-02**



MK-05-K

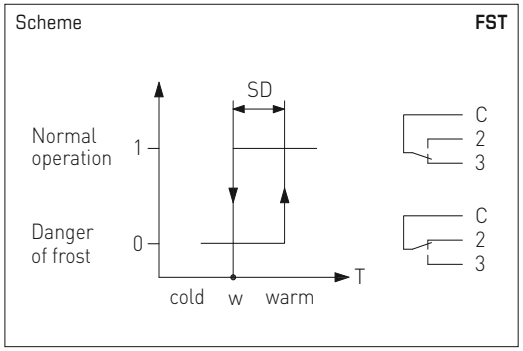


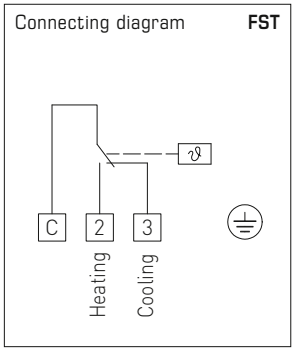
KRD-04



Frost protection thermostats, mechanical, one-step, with switching output

S+S REGELTECHNIK





FST-1D / 5D / 7D / 8D-HR
(manual rest)



FUNCTION

The switch inside frost protection thermostat **FST** responds (closes contact C-2) when temperature falls below the preset temperature setpoint over a capillary tube length of at least 40 cm. Simultaneously contact C-3 breaks and can be used as a signal contact. Resetting (closing contact C-3) happens automatically when temperature rises above the preset setpoint value again (on type **FST-xR** resetting must be done manually by pressing the reset button).

The **FST** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and therefore can be used as operating contact. The air temperature is detected over the entire sensor length (capillary tube). The gas-filled (R 507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

Capillary tube: The capillary tube is laid uniformly at the hot side of the air heater to be protected (in case of air coolers in front of the air cooler) at a distance of approx. 5 cm crosswise to the heat exchanger tubes over the entire area. For test purposes, it is recommended to make a loop of approx. 20 cm directly underneath the housing and before entering the air duct. To avoid damaging the capillary tube, a minimum bending radius of 20 mm must be observed. Installation is facilitated by using the mounting clamps available under accessories.

Frost simulation: The frost situation can be simulated and functioning of the device can be tested by dipping the capillary tube testing loop into a pot filled with ice water.

FST-3D-HR
(manual rest)



WS-03
Weather and sun protection hood
(optional)



FST-xD
TW = temperature monitor
(automatically switching)



FST-xD-HR
TB = temperature limiter
(manual rest)



THERMASREG® FST Frost protection thermostats, mechanical

Type / WG03B	Temperature Range	Thermal Operating Difference (fixed) approx.	Length of Capillary	Permissible Medium	Item No.	Price
FST-xxD					**TW**	
FST-1D *	–10…+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-0102-000	**89,76 €**
FST-3D *	–10…+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-0102-000	**91,59 €**
FST-5D *	–10…+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-0102-000	**87,32 €**
FST-7D *	–10…+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-0102-000	**154,73 €**
FST-8D	–10…+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-0102-000	**84,98 €**
FST-xxD-HR					**TB**	
FST-1D-HR *	–10…+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-1102-000	**107,84 €**
FST-3D-HR *	–10…+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-1102-000	**110,52 €**
FST-5D-HR *	–10…+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-1102-000	**107,46 €**
FST-7D-HR *	–10…+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-1102-000	**170,47 €**
FST-8D-HR	–10…+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-1102-000	**100,70 €**
Features:	FST-x**D** FST-x**D-HR**	**TW** = temperature monitor (**automatically switching**) **TB** = temperature limiter (**manual reset**)				

ACCESSORIES

KRD-04	Capillary tube gland bracket	7100-0030-7000-000	**9,18 €**
MK-05-K	Mounting clamps (6 pieces) plastic (*= included in the scope of delivery)	7100-0034-1000-000	**10,18 €**
TH-MS-01	Immersion sleeves, brass, for **FST-3** Installation length (EL) = 130 mm, flange = 10 mm, R1/2"	7100-0011-5402-000	**16,02 €**
TH-VA-02	Immersion sleeves, stainless steel **V2A** (1.4301), for **FST-3** Installation length (EL) = 130 mm, flange = 10 mm, G1/2"	7100-0012-5402-000	**41,96 €**
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information see last chapter!		

THERMASREG® FST-K

**Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output**

S+S REGELTECHNIK

Mechanical frost protection thermostat / frost monitor **THERM**ASREG® **FST-K** with switching output, duct tube monitored across the entire length, with automatic reset or with mechanical locking, with / without optional manual reset.

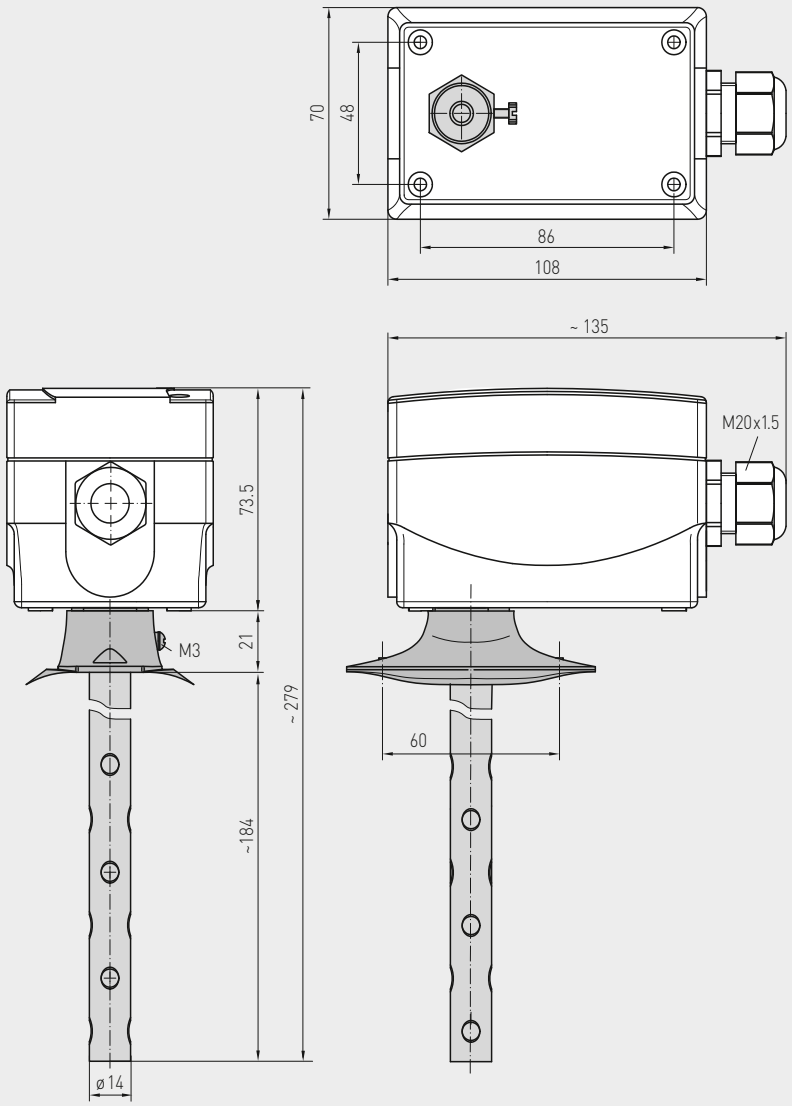
The frost protector is suitable for air side temperature monitoring at heat exchangers and heating registers to prevent freezing up and to avoid frost damage, e.g. in ventilation and air conditioning ducts. The FST-K is intrinsically safe and is equipped with sensor breakage detection. In the event of damage to the capillary membrane system, the frost sensor automatically switches to the heating function. The scope of delivery includes the mounting flange **MF-14-K**.

TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	–10...+15 °C / +14 °F...+59 °F, factory setting to w = +5 °C (+41 °F)
Operating difference:	2 ± 1 K (3.6 ± 1.8 °F)
Reproducibility:	± 0.5 K (± 0.9 °F)
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Resetting:	**FST-K** automatic **FST-K-HR** manual (by hand)
Permissible medium:	Air
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: w + min. +2 °C (min. +3.6 °F) storage / transport: –30...+70 °C (–22...+158 °F)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; with strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm², via screw terminals
Protective tube:	**metal,** material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Protection class:	I (according to EN 60 730-1)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
FUNCTION	Contact C - 2: danger of frost / sensor breakage Contact C - 3: normal operation

For further information and accessories see next page...

Dimensional drawing **FST-K**



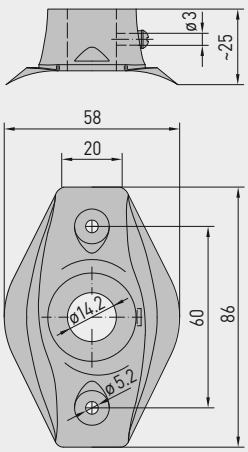
FST-K



FST-K-HR
with manual reset



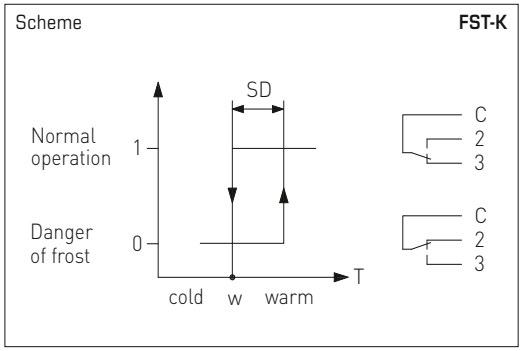
Dimensional drawing **MF-14-K**

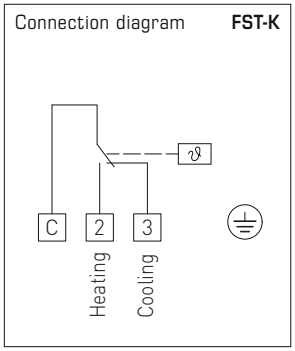


MF-14-K
Mounting flange,
plastic



Duct frost protection thermostat, incl. mounting flange, mechanical, one-step, with switching output





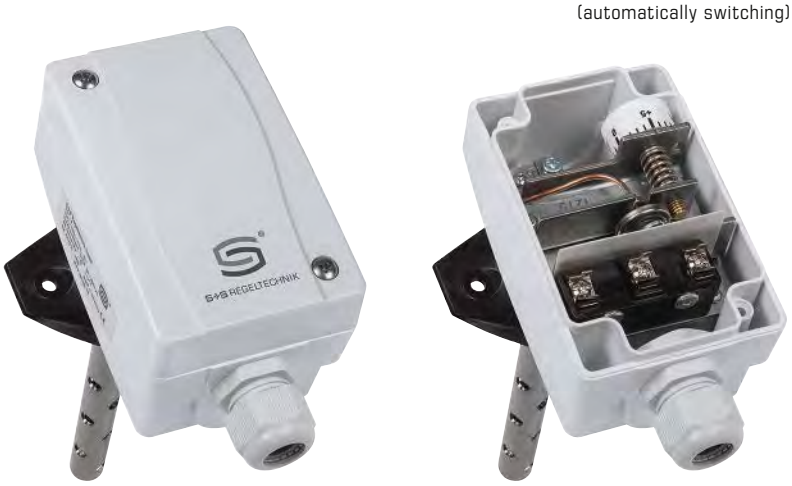
FUNCTION

The switch in the **FST-K** duct frost protection thermostat responds if the temperature across the entire length of the duct tube falls below the preset temperature setpoint (closes contact C - 2). Contact C - 3 opens at the same time and can be used as a signal contact. Resetting occurs automatically (contact closes C - 3) if the temperature rises above the preset setpoint again (on type **FST-K - HR**, resetting must be performed manually using the reset button).

The **FST-K** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C - 2 closes and can therefore be used as an operating contact. The air temperature is detected over the entire length of the sensor (capillary tube). The gas-filled (R 507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

FST-K

TW = temperature monitor
(automatically switching)



FST-K-HR

TB = temperature limiter
(manual rest)



THERMASREG® FST-K Duct frost protection thermostat, mechanical

Type / WG02	Temperature Range	Thermal Operating Difference (fixed) approx.	Function	Permissible Medium	Item No.	Price
FST-K					**TW**	
FST-K	–10…+15 °C	2 K (± 1 K)	TW	air	1102-1064-0100-001	**123,71 €**
FST-K-HR					**TB**	
FST-K HR	–10…+15 °C	2 K (± 1 K)	TB	air	1102-1064-1100-000	**139,46 €**
Equipment:	FST-K FST-K-**HR**	**TW** = temperature monitor (**automatically switching**) **TB** = temperature limiter (**manual reset**)				

ACCESSORIES

MF-14-K	**Mounting flange**, plastic	7100-0030-2000-000	**9,85 €**
	For further information see last chapter!		

THERMASREG® FS-20

**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

S+S REGELTECHNIK

Electronic frost protection thermostat / frost monitor **THERM**ASREG® **FS-20** with switching relayoutput, continuous temperature and valve output (summation output 0–10V) and control and cascading output (0–10V), optionally with connection for heating element, in an impact-resistant plastic housing with quick-locking screws, with display by default, with fully active sensorrod made from copper.

The frost monitor is used to monitor air conditioning systems, heat exchangers, heating registers and similar systems, and protects against frost damage and freezing. Falling below the limit value is detected at the coldest measuring point of the capillary tube, the sensor rod is active along its entire length. Uses internal diagnostics to detect capillary breakage, power failure or electric damage to the sensor as an error and the relay automatically switches to frost.

The innovative 2-phase frost protection thermostat enables simple combination of several devices (cascading) for demand-oriented, comprehensive frost monitoring. The delivery scope includes the mounting clamps **MK-05-K** for expert attachment of the sensor rod.

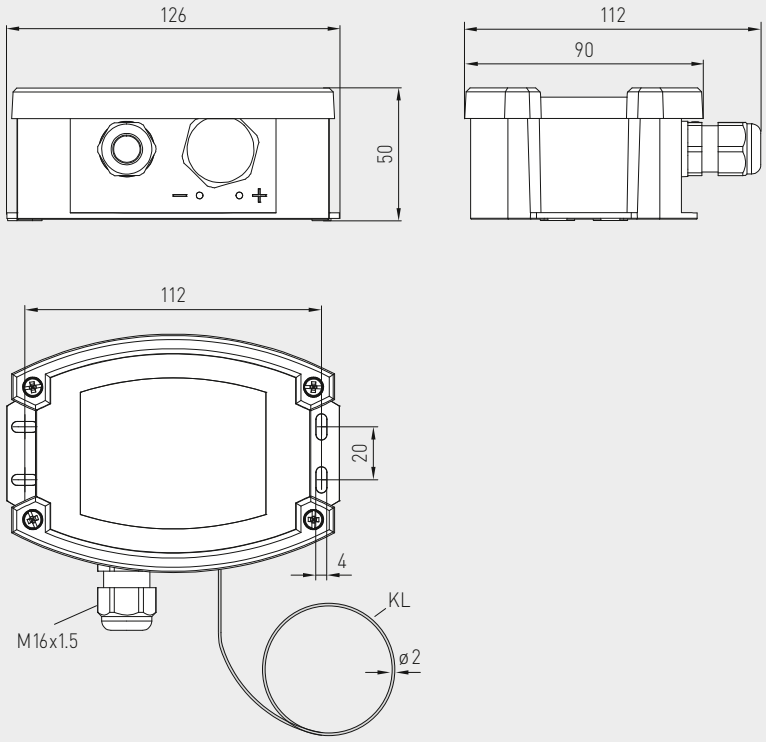
FS-20



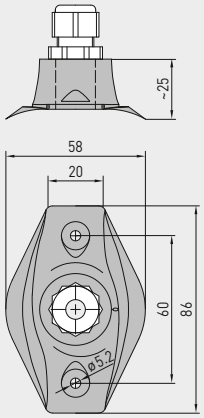
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	R_L > 50 kOhm
Measuring range:	0...+15 °C
Input:	1 x 0-10 V control input DDC 1 x 0-10 V **ascading input**
Output:	1 x 0-10 V output temperature (corresponding to 0...+15 °C) 1 x 0-10 V output valve (frost signal with control voltage and cascading) 1 x potential-free changeover contact (24 V), range of adjustment 0...+15 °C
Current consumption:	max. 100 mA at 24 V DC (**FS-20** without heating element) max. 200 mA at 24 V DC (**FS-20 xx HE** with heating element)
Accuracy:	typically ± 1 K (at +10 °C)
Hysteresis of the switch step:	2K
Turn-on/run-in time :	< 1 min
Response time:	t_{90} < 5 s
Sensor and capillary tube:	Copper sensor rod, length of 3 m or 6 m, active along the entire sensor length, min. response length of 25 cm
Ambient temperatures:	**Sensor and capillary tube:** –20...+60 °C (capillary tube at a distance of > 20 cm from the housing) **Housing:** –15...+50 °C **Storage / transport:** –30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable gland:	M 16 x 1.5 ; including strain relief, exchangeable, max. inner diameter 10.4 mm
Process connection:	by mounting clamps **MMK-05-K** (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the actual temperature, measuring range overrange/underrange of the set switch point (frost protection temperature), and alarm indicator for "frost" or "error" (capillary breakage, overvoltage/undervoltage)
Internal diagnostics:	**Error 1** in case of cable / capillary breakage **Error 2** in case of undervoltage / overvoltage (relay automatically switches to frost)

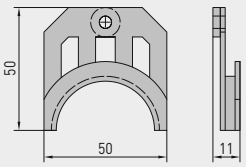
Dimensional drawing **FS-20**



Dimensional drawing **KRD-04**



Dimensional drawing **MK-05-K**



WS-03
Weather and sun protection hood
(optional)



MK-05-K



KRD-04



**2-phase frost protection thermostat,
with control and cascading input,
with active and switching output**

S+S REGELTECHNIK

FUNCTION

The filling used in the copper capillary tube in the frost protection monitor generates a pressure signal that is proportional to the lowest temperature on the entire capillary tube (but min. 200 mm). This is converted into an electrical signal by a sensor and electronically amplified. The standard signal 0-10 V generated as a result corresponding to 0...+15°C is issued. This voltage is available at the "Temp." terminal.

The internal potentiometer can be used to specify a **frost switchpoint** "FS" for the potential-free changeover contact in the range from 0 °C (left limit stop) to +15 °C (right limit stop). If this switchpoint "FS" is undershot, the relay output switches to the "frost protection" position (contact "W" connected to contact "Ö"). If the temperature rises by more than 2 K above the set switchpoint "FS", the device switches back to normal operating mode if "**Reset Auto**" is selected. The relay drops out to the initial position (contact "W" connected to contact "S"). If the "**Reset Hand**" operating mode is selected, the relay output does not automatically switch even if the set switchpoint "FS" +2 K is exceeded, but must be manually reset from the **reset button**.

In addition, a second voltage output "AV", mapped by 0-10 V, is available. At a voltage of 0 V at the control input "SE", the output voltage "AV" is always 0 V if the measured temperature is at least 6 K above the set switchpoint "FS". If the measured temperature falls below the set switchpoint "FS"+6 K, the voltage output "AV" increases in a linear fashion from 0 V to 10 V. The increase here amounts to 1.67 V for every degree Kelvin by which the temperature approaches the preset switchpoint "FS". The output voltage 10 V is therefore issued at "FS" = measured temperature. If you increase "SE", the output voltage "AV" is increased by this amount. The "AV" output therefore represents a summation output for the input variables "SE" and "Frost signal". In this case, the "Frost signal" variable describes the output behaviour of "AV" at "SE" = 0 V. The maximum output voltage is restricted to 10 V.

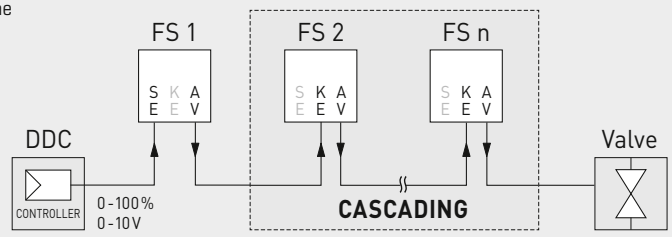
Several frost protection devices can be connected to each other via the **cascading input** "KE" to cover a larger channel cross-section for frost monitoring. The AV output of the first device is connected to the KE input of the second device. The internal device logic decides on the priority frost signal of both devices for controlling the heating register valve.

In the event of capillary breakage, electrical sensor damage (cable breakage), voltage failure, falling short of the permissible voltage level or exceeding it, the relay output is automatically switched to "Frost protection" (contact "W" connected to contact "Ö").

NOTE

The capillary tube must be securely seated in the socked and must not twist.
A redundant setup to protect critical systems is **absolutely necessary.**

Scheme **FS-20**



Display readout **FS-20**



Normal operation
Actual temperature and
set switchpoint temperature



Frost protection alarm
Actual temperature is
below switchpoint temperature



Measuring range exceeded
Actual temperature rises
above +15 °C



Measuring range underranged
Actual temperature falls
below 0 °C

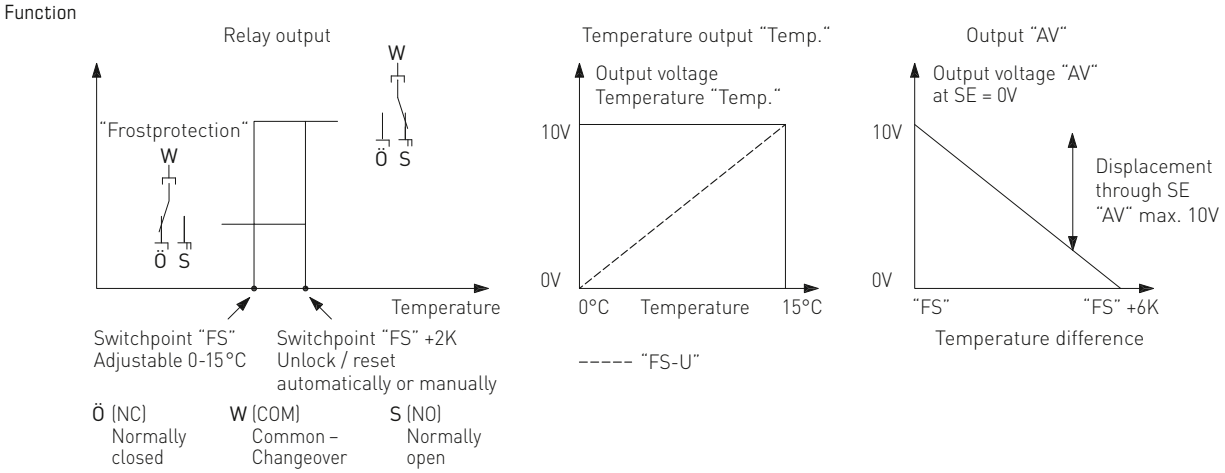


Error message 1
in case of cable/
capillary breakage

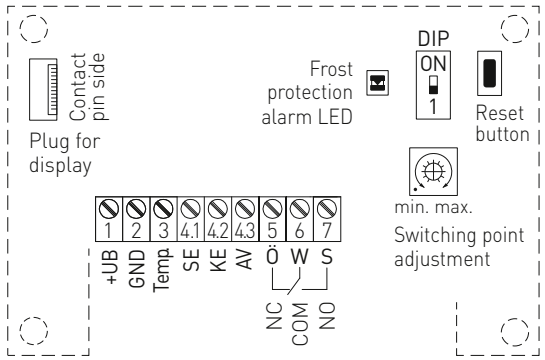


Error message 2
in case of undervoltage/
overvoltage

Function **FS-20**



Connecting diagram **FS-20**



UB+	Operating voltage 24V AC/DC
GND	Operating voltage –UB GND
Temp.	Output temperature 0-10V = 0...+15°C
SE	Control input 0-10V
KE	Cascading input 0-10V
AV	Output valve 0-10V
Ö	(NC) Normally Closed
W	(COM) Common – changeover (24 V)
S	(NO) Normally Open

FS-20



DIP switch	FS-20
Resetting after frost protection (Mode adjustable)	**DIP 1**
Reset Hand (manually) Alarm remains saved	**ON**
Reset Auto (automatically) Alarm is reset automatically (default)	OFF

THERMASREG® FS-20 Two-phase frost protection thermostats

Type / WG02	Measuring Range	Output	Sensor length	Display	Item No.	Price
FS-20						
FS20-UW 3m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	3,0 m	■	1102-1012-2102-030	**263,70 €**
FS20-UW 6m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	6,0 m	■	1102-1011-2102-030	**309,78 €**
FS-20 xx HE					**with heating element**	
FS20-UW-HE 3m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	3,0 m	■	1102-1012-2112-030	**286,99 €**
FS20-UW-HE 6m LCD	0...+15 °C	2 x 0-10 V, 1 x changeover contact	6,0 m	■	1102-1011-2112-030	**334,20 €**

ACCESSORIES			
KRD-04	Capillary tube gland bracket	7100-0030-7000-000	**9,18 €**
MK-05-K	Mounting clamps (6 pieces) plastic (included in the scope of delivery)	7100-0034-1000-000	**10,18 €**
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information see last chapter!		

Humidity

HYGRASGARD® & **HYGR**ASREG®
No chance for mould and corrosion

You can be sure that our humidity transmitters and humidity controllers will never let you down when it comes to preventing mould and rust.

Thanks to an accuracy of up to 2 % RH, you will always be on the safe side.
The range of applications extends from standard applications in building automation all the way to demanding cleanroom applications.

Application Areas

- Refrigeration, air conditioning, ventilation and cleanroom technology
- Food and pharmaceutical industry
- Hospitals, museums, office buildings and greenhouses
- Production facilities, laboratories, computer rooms and control cabinets
- Meteorology



S+S REGELTECHNIK



HYGRASGARD® & **HYGR**ASREG®
HUMIDITY SENSORS, CONTROLLERS, HYGROSTATES

Room sensors

RFF/RFTF	Room humidity sensor, on-wall	**375**
FSFM/FSFTM	Room humidity sensor, in-wall	**377**
DFF/DFTF	In-ceiling humidity sensor	**381**
RPFF-SD	Pendulum room humidity sensor	**435**
RPFF/RPFTF	Pendulum room humidity sensor	**439**
RPFF/RPFTF-25	Pendulum room humidity sensor, pluggable	**443**
VFF/VFTF	Showcase humidity sensor	**447**

Duct sensors

KFF/KFTF-SD	Duct humidity sensor	**412**
KFF/KFTF	Duct humidity sensor	**413**
KFF/KFTF-20	Duct humidity sensor	**415**
KFTF-20-VA	Duct humidity sensor (Stainless steel housing Tyr 2E)	**421**
KFTF-35	Duct humidity sensor for high humidity NEW	**425**
KAVTF	Duct humidity sensor	**429**

On-wall sensors

AFF/AFTF-SD	On-wall humidity sensor	**385**
AFF/AFTF	On-wall humidity sensor	**390**
AFF/AFTF-20	On-wall humidity sensor	**393**
AFTF-20-VA	On-wall humidity sensor (Stainless steel housing Tyr 2E)	**399**
AFF/AFTF-25	On-wall humidity sensor, pluggable	**391**
AFTF-35	On-wall humidity sensor for high humidity NEW	**403**
AAVTF	Outdoor humidity sensor	**407**

Screw-in sensors

ESFTF	Screw-in humidity sensor for pressure systems NEW	**433**

Hygrostats

AH-40	On-wall hygrostat, one-step	**453**
KH-10	Duct hygrostat, one-step	**459**
KH-40	Duct hygrostat, one-step	**461**

Hygrothermostats

RHT-30	Room hygrothermostat, two-step	**451**
AHT-30	On-wall hygrothermostat, two-step	**457**
KHT-30	Duct hygrothermostat, two-step	**465**

Condensation control switch, dew point control switch, leakage sensor

KW-SD	Condensation control switch	**468**
KW	Condensation control switch	**469**
TW	Dew point control switch	**473**
LS	Leakage sensor	**475**

Immersion sleeves and accessories

see chapter Accessories	**638**

Humidity

HYGRASGARD® & **HYGR**ASREG®
Sensor technology for humidity and temperature

Broad Spectrum

All our humidity measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications.

Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

These devices are developed and manufactured according to the latest criteria; latest generation digital sensors are installed. All devices are produced at our factory and are calibrated and 100 % checked in our climatic exposure test cabinets. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Tested safety and certified quality

RoHS conforming materials

ESD compliant manufacturing

DIN tested / certified devices

CE conformity

UKCA conformity (UK Conformity Assessed)

EAC certified

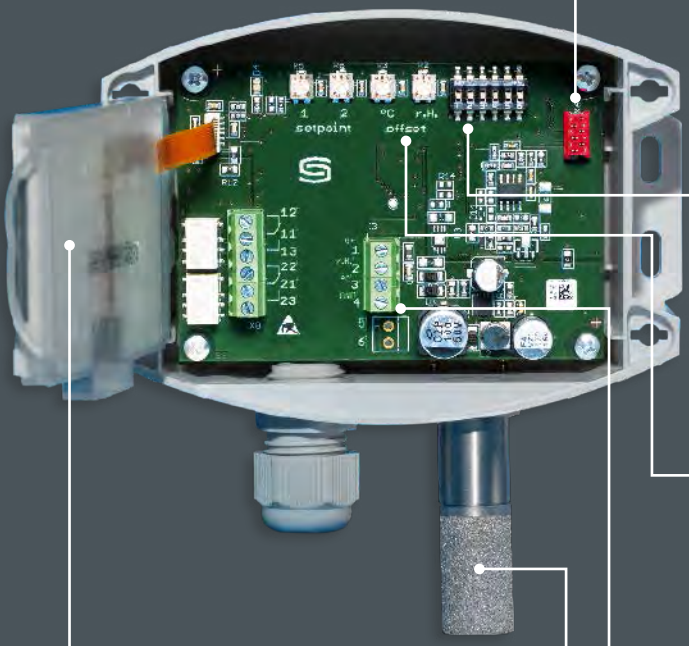
GOST certified

Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

The **HYGR**ASGARD® **3112** with current output (Test No. D8 0910 69871 003) and the **HYGR**ASGARD® **3111** with voltage output (Test No. D8 0910 69871 004) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

PROUDLY MADE IN GERMANY

S+S REGELTECHNIK



1



Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

2



Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets

3



DIP Switches

For multi-range toggling as well as setting of measuring ranges, response times, damping times, units and configuration levels

4



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

5



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output

6

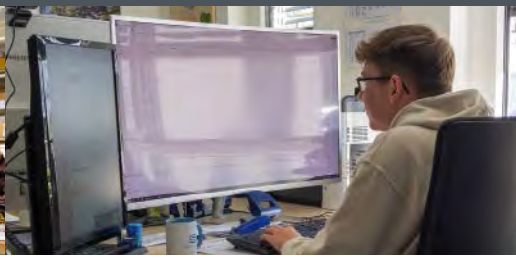


Digital Humity & Temperature Probe

Highly precise, longterm stable and temperature compensated







HYGRASGARD® RFF
HYGRASGARD® RFTF

Room humidity and temperature sensors (± 2.0 %), on-wall, calibratable, with active / passive output

S+S REGELTECHNIK

The calibratable room humidity and temperature sensor **HYGR**ASGARD® **RFF/RFTF** measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0 -10 V or 4...20 mA and is available with or without an optional display (for displaying actual humidity and actual temperature) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. The relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

It is used in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, in interior rooms such as residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of air temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC ; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor** **with integrated temperature sensor,** small hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0 ... 95 % RH (non-precipitating air)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 -10 V for U variant 4...20 mA for I variant, working resistance < 800 Ω, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	0...+ 50 °C (output corresponding to 0 -10 V or 4... 20 mA or Ohm value) others upon request!
Operating range, temperature:	0...+ 50 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage –25...+50 °C, operation –5...+55 °C
Electrical connection:	2-, 3- or 4-wire connection (see connecting diagram) 0.14 -1.5 mm² via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	±1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination, 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

The two-line display readout switches between the ACTUAL humidity reading in % RH and the ACTUAL temperature reading in °C.

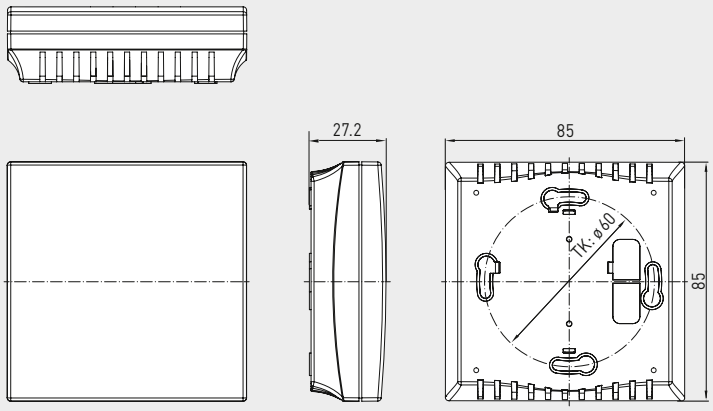
Backlighting is installed for better instrument readability.

Display Readout **RFTF**



Dimensional drawing
(Baldur 1)

RFF
RFTF



RFF
RFTF



RFF
RFTF
without display



RFF
RFTF
with display



RFF
RFTF
with display

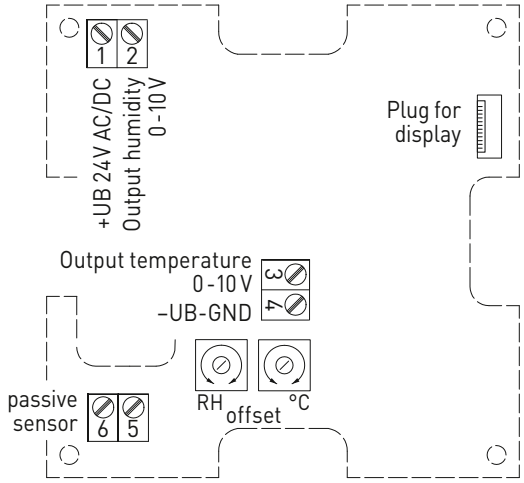


HYGRASGARD® RFF
HYGRASGARD® RFTF

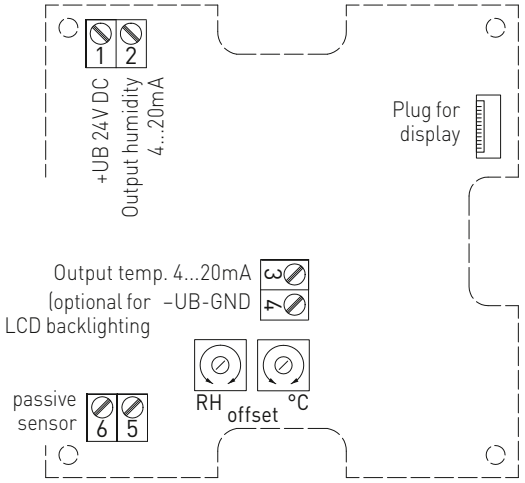
Room humidity and temperature sensors (± 2.0 %), on-wall, calibratable, with active / passive output

S+S REGELTECHNIK

Schematic diagram (Baldur 1)
RFTF-U-x
RFTF-U-x with display



Schematic diagram (Baldur 1)
RFTF-I-x
RFTF-I-x with display



3-wire connection
RFF-U

1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Free
4 –UB-GND

2- or 3-wire connection *
RFF-I (Transmitter)

1 +UB 24V DC
2 Output humidity 4...20mA
3 Free
4 –UB-GND (optional for backlighting)

4- or 6-wire connection
RFTF-U (passive temperature sensor)

1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Output temperature 0-10V
4 –UB-GND
5 Passive element
6 e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection
RFTF-U
RFTF-U with display

1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Output temperature 0-10V
4 –UB-GND

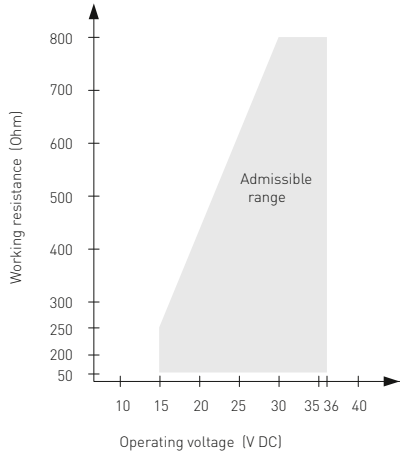
3- or 4-wire connection **
RFTF-I (Transmitter)

1 +UB 24V DC
2 Output humidity 4...20mA
3 Output temperature 4...20mA
4 –UB-GND (optional for backlighting)

4- or 6-wire connection
RFTF-I (passive temperature sensor)

1 +UB 24V DC
2 Output humidity 4...20mA
3 Output temperature 4...20mA
4 –UB-GND (optional for backlighting)
5 Passive element
6 e.g. Pt1000, Ni1000, LMZ235Z

Load resistance diagram 4...20 mA
RFF / RFTF



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

At the **I variant** the humidity path must be connected!

Humidity table
MR: 0 ...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**50**	5.0	12.0
5	0.5	4.8	**55**	5.5	12.8
10	1.0	5.6	**60**	6.0	13.6
15	1.5	6.4	**65**	6.5	14.4
20	2.0	7.2	**70**	7.0	15.2
25	2.5	8.0	**75**	7.5	16.0
30	3.0	8.8	**80**	8.0	16.8
35	3.5	9.6	**85**	8.5	17.6
40	4.0	10.4	**90**	9.0	18.4
45	4.5	11.2	**95**	9.5	19.2
Continued at the right ...			**100**	10.0	20.0

Temperature table
MR: 0 ...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

HYGRASGARD® RFF Room humidity sensors
HYGRASGARD® RFTF Room humidity and temperature sensors

Type / WG01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No. (Baldur 1)	Price
RFF						(active)	
RFF-I	0...100 % RH	–	4...20 mA	–		1201-41A2-0000-000	**122,48 €**
RFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-41A2-0200-000	**179,64 €**
RFF-U	0...100 % RH	–	0-10 V	–		1201-41A1-0000-000	**122,48 €**
RFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-41A1-0200-000	**179,64 €**
RFTF						(active)	
RFTF-I	0...100 % RH	0...+50 °C	4...20 mA	4...20 mA		1201-41A2-1000-000	**126,29 €**
RFTF-I **LCD**	0...100 % RH	0...+50 °C	4...20 mA	4...20 mA	■	1201-41A2-1200-000	**183,57 €**
RFTF-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V		1201-41A1-1000-000	**126,29 €**
RFTF-U **LCD**	0...100 % RH	0...+50 °C	0-10 V	0-10 V	■	1201-41A1-1200-000	**183,57 €**

HYGRASGARD® RFTF-U xx Room humidity and temperature sensors

Type / WG01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Item No. (Baldur 1)	Price
RFTF-U xx	**Pt, Ni, LM235Z**				(active / passive)	
RFTF-U Pt100	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Pt100	1201-41A1-2001-000	**168,18 €**
RFTF-U Pt1000	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Pt1000	1201-41A1-2005-000	**171,65 €**
RFTF-U Ni1000	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Ni1000	1201-41A1-2009-000	**172,82 €**
RFTF-U NiTK	0...100 % RH	0...+50 °C	0-10 V	0-10 V + Ni1000TK5000	1201-41A1-2010-000	**173,07 €**
RFTF-U LM235Z	0...100 % RH	0...+50 °C	0-10 V	0-10 V + LM235Z, 10mV / K	1201-41A1-2021-000	**172,42 €**
RFTF-U xx	**NTC**				(active / passive)	
RFTF-U NTC1,8K	0...100 % RH	0...+50 °C	0-10 V	0-10 V + NTC 1,8 kOhm	1201-41A1-2012-000	**172,96 €**
RFTF-U NTC10K	0...100 % RH	0...+50 °C	0-10 V	0-10 V + NTC 10 kOhm	1201-41A1-2015-000	**169,20 €**
RFTF-U NTC20K	0...100 % RH	0...+50 °C	0-10 V	0-10 V + NTC 20 kOhm	1201-41A1-2016-000	**169,20 €**
Extra charge:	Two-line **display** with illumination					**51,32 €**

HYGRASGARD® FSFM
HYGRASGARD® FSFTM

Room humidity and temperature sensor or measuring transducer, in-wall in the panel switch programme, with active output

S+S REGELTECHNIK

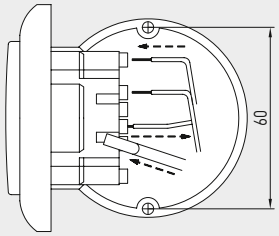
The room sensor **HYGR**ASGARD® **FSFM / FSFTM** in the in-wall housing is used for measuring the relative humidity and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc

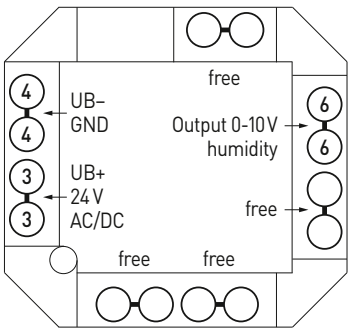
Mounting diagram **in-wall**



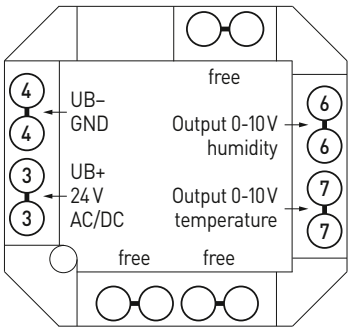
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC
HUMIDITY	
Sensor:	**digital humidity sensor, with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %
Output, humidity:	0-10 V
TEMPERATURE	
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	**IP 20** (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFM**

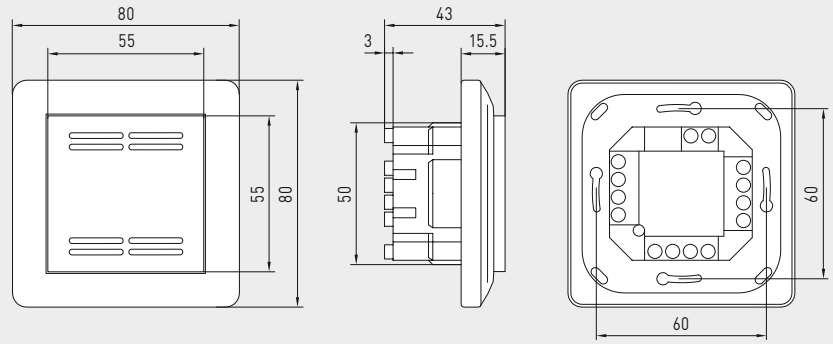


Connection diagram **FSFTM**



Dimensional drawing

FSFM
FSFTM



FSFM
FSFTM



Humidity table
MR: 0...100 % RH

% RH	U_A [V]	% RH	U_A [V]
0	0	**50**	5.0
5	0.5	**55**	5.5
10	1.0	**60**	6.0
15	1.5	**65**	6.5
20	2.0	**70**	7.0
25	2.5	**75**	7.5
30	3.0	**80**	8.0
35	3.5	**85**	8.5
40	4.0	**90**	9.0
45	4.5	**95**	9.5
Continued to the right ...		**100**	10.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

HYGRASGARD® FSFM Room humidity sensor or measuring transducer, in-wall
HYGRASGARD® FSFTM Room humidity and temperature sensor or measuring transducer, in-wall

Type / WG02	Measuring Range Humidity	Temperature	Output Humidity	Temperature	Item No.	Price
FSFM						
FSFM-U	0...100 % RH	–	0-10 V	–	1201-9121-0000-162	**246,67 €**
FSFTM						
FSFTM-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162	**254,00 €**

HYGRASGARD® DFF
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable humidity and temperature sensor **HYGR**ASGARD® **DFF / DFTF** measures the relative humidity and temperature of air. It converts the measurands into a standard signal of 0 - 10 V or 4...20 mA, and is available with / without an optional display.

It is equipped with four switchable temperature ranges. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The ceiling-installed sensor is used in non-aggressive, dust-free environments and is used for installation in suspended ceilings in corridors, offices, as well as in residential and commercial buildings. The connecting head is pluggable for quick, easy mounting.
The measuring transducer is accommodated in a separate housing.

DFF
DFTF



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V or 4...20 mA)
Operating range, humidity:	0..95 % RH (without formation of dew)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with 4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 - 10 V or 4...20 mA)
Deviation temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V or 4...20 mA
Ambient temperature:	storage –5...+60 °C; operation –5...+60 °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, **pluggable**, Ø = approx. 35 mm, H = approx. 29 mm, with metal sinter filter made of stainless steel **V4A** (1.4404)
Mounting (sensor):	in the suspended ceiling, ceiling cut-out Ø = 30 mm, cover Ø = < 35 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according EN 60 529) Housing **IP 30** (according EN 60 529) Sensor in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

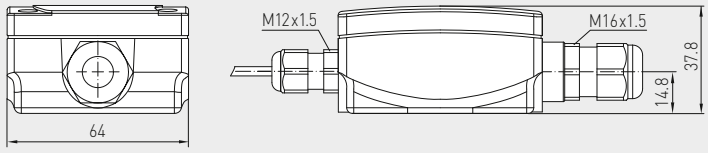
DFF
DFTF
Connecting head, pluggable



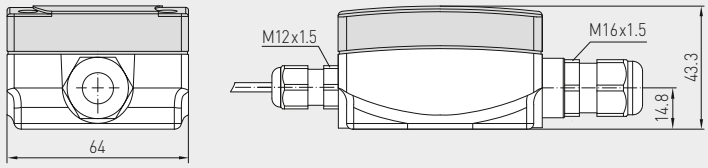
Dimensional drawing

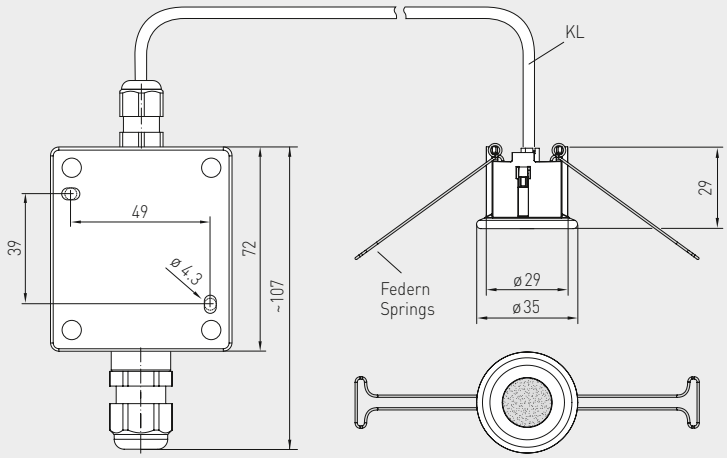
DFF
DFTF

without display



with display





DFF
DFTF
with display





M12 connector
(optional on request)

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

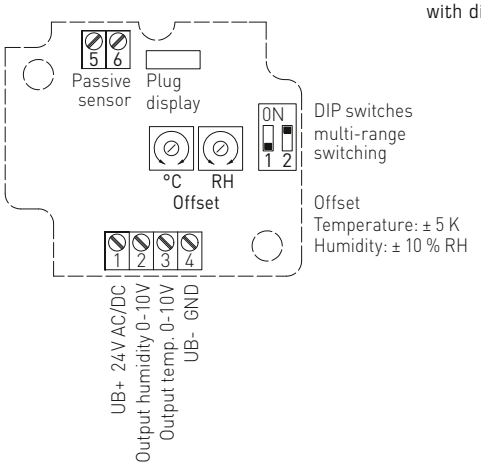
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® DFF
HYGRASGARD® DFTF

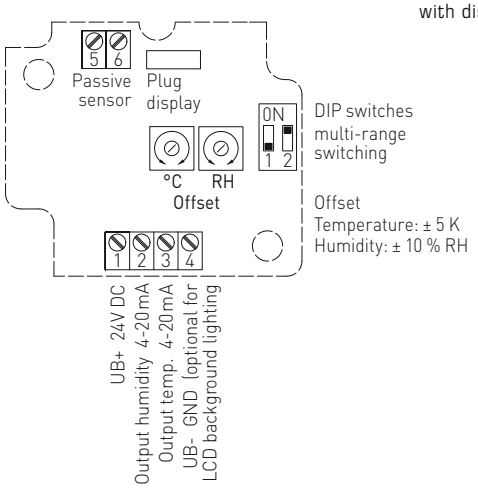
In-ceiling humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **DFTF-U** with display



Schematic diagram** **DFTF-I** with display



3-wire connection **DFF-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection* **DFF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Free
4	–UB-GND (optional for backlighting)

4-wire connection **DFTF-U**

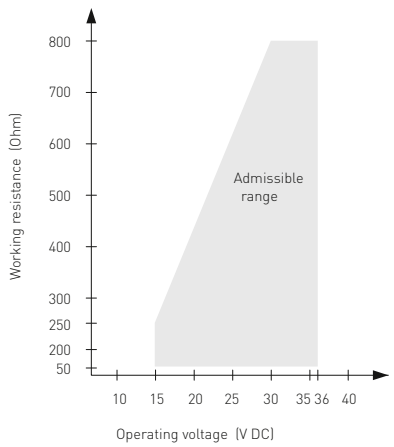
1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND

3- or 4-wire connection** **DFTF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Output temperature 4-20mA
4	–UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram 4…20 mA **DFF DFTF**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® DFF
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

DFF
DFTF
with display



HYGRASGARD® **DFF**	In-ceiling humidity sensors (± 2.0 %), *Premium*
HYGRASGARD® **DFTF**	In-ceiling humidity and temperature sensors (± 2. 0 %), *Premium*

Type / WG01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
DFF-I						**I-variant**	
DFF-I	0...100 % RH	–	4...20 mA	–		1201-6132-0000-100	**352,92 €**
DFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-6132-0200-100	**412,75 €**
DFF-U						**U-variant**	
DFF-U	0...100 % RH	–	0-10 V	–		1201-6131-0000-100	**352,92 €**
DFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-6131-0200-100	**412,75 €**
DFTF-I						**I-variant**	
DFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-6132-1000-100	**361,47 €**
DFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-6132-1200-100	**421,31 €**
DFTF-U						**U-variant**	
DFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-6131-1000-100	**361,47 €**
DFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-6131-1200-100	**421,31 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable outdoor humidity / temperature sensors **HYGR**ASGARD® **AFF-SD / AFTF-SD** measure the relative humidity and / or temperature of air. They convert the measurands into standard signals of 0 -10 V or 4...20 mA and are available with or without an optional display. Terminal box housing made of impact-resistant plastic with housing cover with quick-locking screws. They have four switchable temperature ranges and are applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFF-SD
AFTF-SD
compact form



SF-M
Metal sinter filter (optional)



TECHNICAL DATA

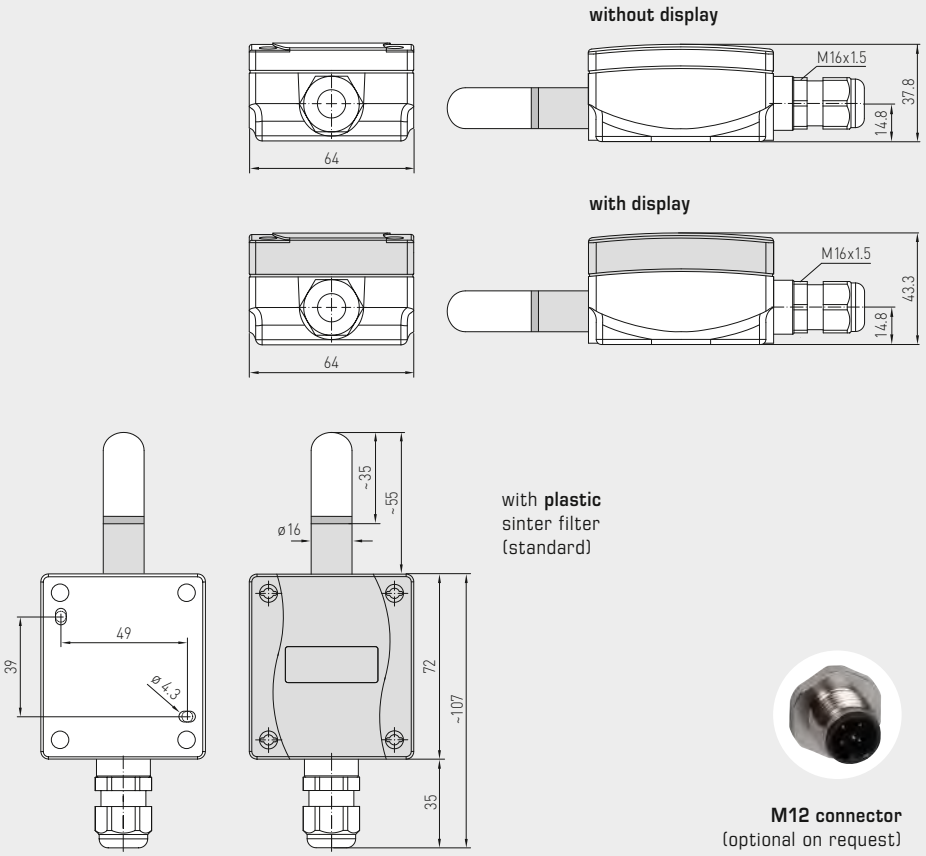
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 -10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C** (output corresponding to 0 -10 V or 4 ... 20 mA)
Deviation, temperature:	typically ± 0.6 K at +25 °C
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage –35...+85 °C, operation – 30...+70 °C, non-precipitating
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 55 mm
Process connection:	by screws
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with** illumination, cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

Dimensional drawing

AFF-SD
AFTF-SD



with **plastic** sinter filter (standard)

M12 connector
(optional on request)

AFF-SD
AFTF-SD
compact form with display



SF-M
Metal sinter filter (optional)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
– 30	0.5	4.7
– 25	0.9	5.5
– 20	1.4	6.2
– 15	1.8	6.9
– 10	2.3	7.6
– 5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
– 30	0.7	5.1
– 25	1.4	6.3
– 20	2.1	7.4
– 15	2.9	8.6
– 10	3.6	9.7
– 5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

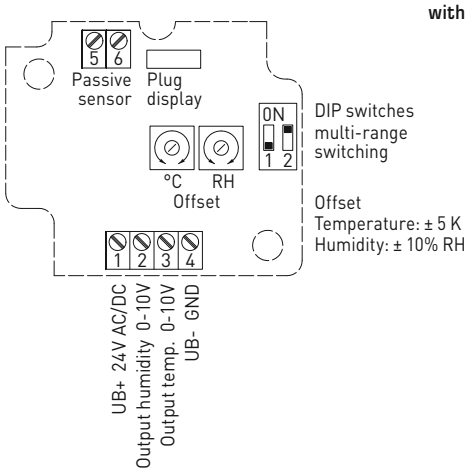
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

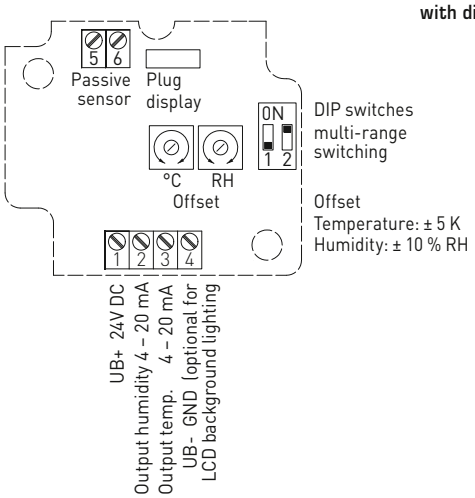
On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **AFTF-SD-U with display**



Schematic diagram** **AFTF-SD-I with display**



3-wire connection **AFF-SD-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection* **AFF-SD-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Free
4	–UB-GND (optional for backlighting)

4-wire connection **AFTF-SD-U**

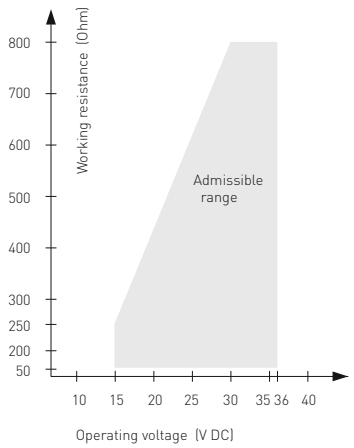
1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND

3- or 4-wire connection** **AFTF-SD-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Output temp. 4-20mA
4	–UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram **AFF-SD / AFTF-SD** 4…20 mA



Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (± 2.0 %), compact form, calibratable, with multi-range switching and active output

WS-04
Weather and sun protection hood (optional)



AFF-SD
AFTF-SD
compact form with display





HYGRASGARD® **AFF-SD**	On-wall humidity sensors, compact form (± 2.0 %), *Standard*
HYGRASGARD® **AFTF-SD**	On-wall humidity and temperature sensors, compact form (± 2.0 %), *Standard*

Type / WG01B	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
AFF-SD-I						**I-variant**	
AFF-SD-I	0...100 % RH	–	4...20 mA	–		1201-1122-0000-100	**186,19 €**
AFF-SD-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-1122-0200-000	**238,65 €**
AFF-SD-U						**U-variant**	
AFF-SD-U	0...100 % RH	–	0-10 V	–		1201-1121-0000-100	**186,19 €**
AFF-SD-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-1121-0200-000	**238,65 €**
AFTF-SD-I						**I-variant**	
AFTF-SD-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-1122-1000-100	**190,13 €**
AFTF-SD-I **LCD**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	■	1201-1122-1200-100	**242,57 €**
AFTF-SD-U						**U-variant**	
AFTF-SD-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-1121-1000-100	**190,13 €**
AFTF-SD-U **LCD**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	■	1201-1121-1200-100	**242,57 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
WS-01	**Sun and ball-impact protection hood**, 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors (± 1.8 % / ± 2.0 %), calibratable, with multi-range switching and active / passive output

S+S REGELTECHNIK

Calibratable outdoor humidity/temperature sensor **HYGR**ASGARD® **AFF/AFTF** (± 2,0 %) and **AFF-20/AFTF-20** (± 1,8 %) with plastic sinter filter (optional metal sinter filter) or **AFF-25/AFTF-25** (± 1,8 %) **with pluggable measuring head** with metal sinter filter; housing made of impact-resistant plastic with quick-locking screws, optionally with / without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and / or temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. They have four switchable temperature ranges and are applied in non-aggressive, dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	< 95 % RH, non-precipitating air
Deviation in humidity:	**AFF / AFTF:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **AFF-20 / AFTF-20, AFF-25 / AFTF-25:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output humidity:	0 - 10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C**
Ambient temperature:	storage –35...+85 °C; operation –30...+80 °C, non-precipitating
Deviation, temperature:	**AFF / AFTF:** typically ± 0.4 K at +25 °C **AFF-20 / AFTF-20, AFF-25 / AFTF-25:** typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant; 4...20 mA for I variant; **AFTF-Uxx** (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm **AFF / AFTF:** NL = 55 mm **AFF-20 / AFTF-20:** NL = 137 mm **AFF-25 / AFTF-25:** NL = 88.5 mm
Sensor protection:	**AFF / AFTF, AFF-20 / AFTF-20:** **plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm) **AFF-25 / AFTF-25:** **pluggable measuring head** (probe), stainless steel **V2A** (1.4301), with metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable
Process connection:	by screws
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line **display with illumination**, cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter

AFF / AFTF (± 2.0 %)
with plastic sinter filter
(standard)



AFF-20 / AFTF-20 (± 1.8 %)
with plastic sinter filter
(standard)

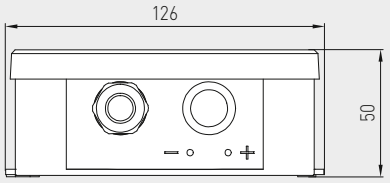


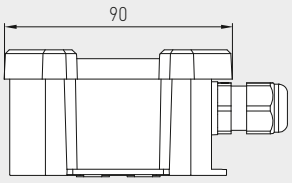
AFF-25 / AFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter



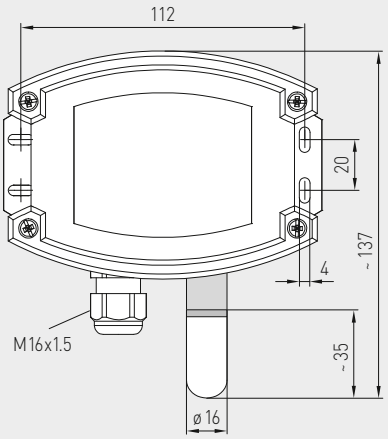
Dimensional drawing

AFF/AFTF
AFF-20/AFTF-20

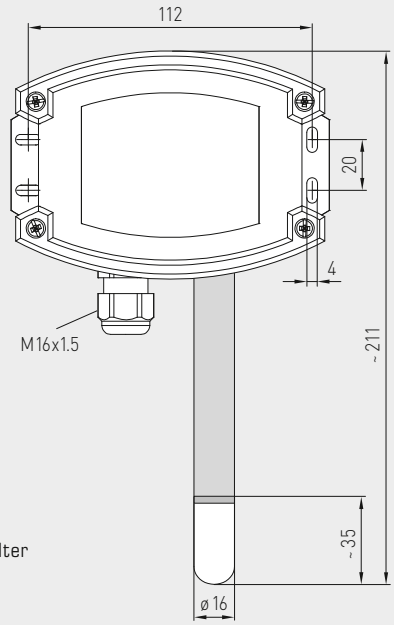




AFF/AFTF



AFF-20/AFTF-20





SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



M12 connector
(optional)

AFF/AFTF (± 2.0 %)
with display and
plastic sinter filter
(standard)

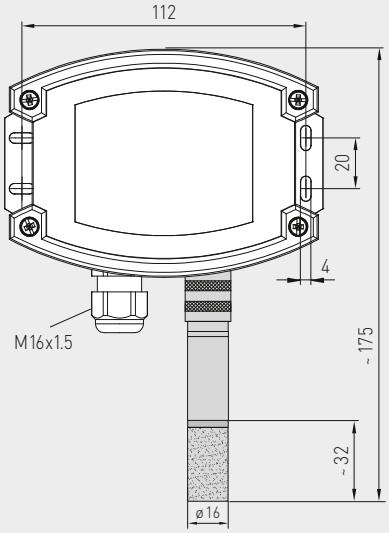


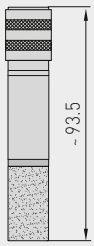
AFF-20/AFTF-20 (± 1.8 %)
with display and
plastic sinter filter
(standard)



Dimensional drawing

AFF-25/AFTF-25





pluggable measuring head
with **metal**
sinter filter

AFF-25/AFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter
and display

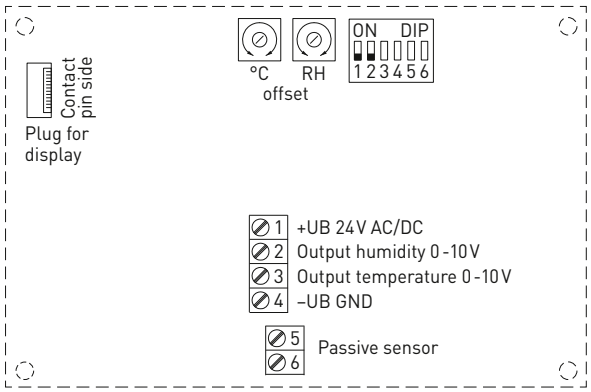


HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors (± 1.8 % / ± 2.0 %), calibratable, with multi-range switching and active/passive output

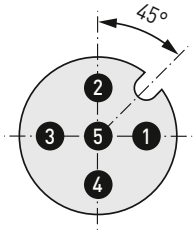
S+S REGELTECHNIK

Schematic diagram **AFTF-xx-U**



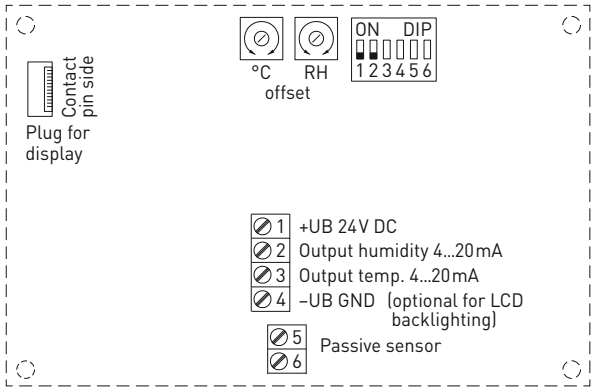
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **AFTF-xx-U**



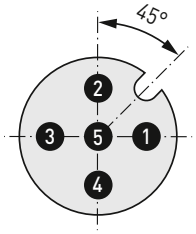
1. +UB 24V AC/DC
2. Output humidity 0-10V [% r.H.]
3. Output temperature 0-10V [°C]
4. –UB GND
5. Shield

Schematic diagram **AFTF-xx-I**



DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **AFTF-xx-I**

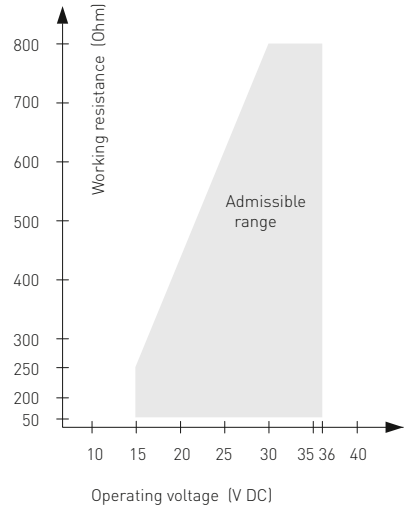


1. +UB 24V DC
2. Output humidity 4...20mA [% r.H.]
3. Output temperature 4...20mA [°C]
4. –UB GND (optional for LCD backlighting)
5. Shield

AFF-xx/AFTF-xx
with display, hinged



Load resistance diagram 4..20mA **AFF-xx-I AFTF-xx-I**



HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors (± 1.8 % / ± 2.0 %), calibratable, with multi-range switching and active/passive output

3-wire connection — **AFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection * — **AFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Free
4	–UB-GND (optional for backlighting)

4- or 6-wire connection — **AFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection — **AFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND

3- or 4-wire connection ** — **AFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Output temp. 4...20mA
4	–UB-GND (optional for backlighting)

4- or 6-wire connection — **AFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Output temp. 4...20mA
4	–UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Connection*:
2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
–30	0.5	4.7
–25	0.9	5.5
–20	1.4	6.2
–15	1.8	6.9
–10	2.3	7.6
–5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
–35	0.0	4.0
–30	0.7	5.1
–25	1.4	6.3
–20	2.1	7.4
–15	2.9	8.6
–10	3.6	9.7
–5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AFF
HYGRASGARD® AFTF

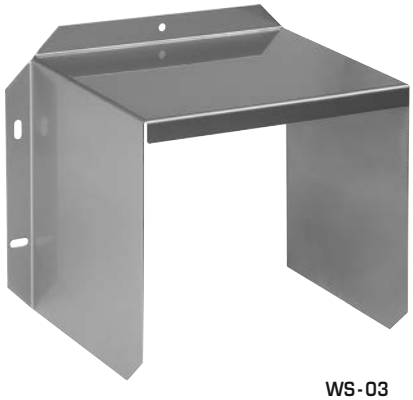
On-wall humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active / passive output

S+S REGELTECHNIK

AFF / AFTF (± 2,0%)
with cable gland







WS-03
Weather and sun protection hood

HYGRASGARD® AFF **HYGRASGARD® AFTF**	On-wall humidity sensors (± 2.0 %), *Standard* On-wall humidity and temperature sensors (± 2.0 %), *Standard*						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFF							
AFF-I	0...100 % RH	–	4...20 mA	–		1201-7112-0000-000	**196,03 €**
AFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-7112-0400-000	**248,48 €**
AFF-U	0...100 % RH	–	0-10 V	–		1201-7111-0000-000	**196,03 €**
AFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7111-0400-000	**248,48 €**
AFTF							
AFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-000	**215,04 €**
AFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000	**267,49 €**
AFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-000	**215,04 €**
AFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-000	**267,49 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

HYGRASGARD® **AFTF-U xx**	On-wall humidity and temperature sensors (± 2.0 %), *Standard* (passive temperature sensor)					
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
AFTF-U xx	**Pt, Ni, LM235Z, NTC**			(active / **passive**)		
AFTF-U Pt100	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + **Pt100**	1201-7111-2001-000	**216,35 €**
AFTF-U Pt1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Pt1000**	1201-7111-2005-000	**217,66 €**
AFTF-U Ni1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000**	1201-7111-2009-000	**218,32 €**
AFTF-U NiTK	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000TK5000**	1201-7111-2010-000	**218,97 €**
AFTF-U LM235Z	0...100 % RH	(4x as above)	0-10 V	0-10 V + **LM235Z**, 10mV / K	1201-7111-2021-000	**217,79 €**
AFTF-U NTC1,8K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 1,8 kOhm**	1201-7111-2012-000	**218,71 €**
AFTF-U NTC10K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 10 kOhm**	1201-7111-2015-000	**215,70 €**
AFTF-U NTC20K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 20 kOhm**	1201-7111-2016-000	**215,70 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)					

HYGRASGARD® AFF-25
HYGRASGARD® AFTF-25

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



AFF-25 / AFTF-25 (± 1,8 %)
with cable gland

HYGRASGARD® **AFF-25**	On-wall humidity sensors, **pluggable** (± 1.8 %), *Deluxe*
HYGRASGARD® **AFTF-25**	On-wall humidity and temperature sensors, **pluggable** (± 1.8 %), *Deluxe*

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
AFF-25							
AFF-25-I	0...100 % RH	–	4... 20 mA	–		1201-7132-0000-101	**367,13 €**
AFF-25-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-7132-0400-101	**418,45 €**
AFF-25-U	0...100 % RH	–	0-10 V	–		1201-7131-0000-101	**367,13 €**
AFF-25-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7131-0400-101	**418,45 €**
AFTF-25							
AFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7132-1000-101	**389,42 €**
AFTF-25-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7132-1400-101	**440,75 €**
AFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7131-1000-101	**389,42 €**
AFTF-25-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7131-1400-101	**440,75 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
MSK-25	Pluggable **measuring head** (probe) stainless steel **V2A** (1.4301), **Metal** sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable replacement element for **AFF-25 / AFTF-25**	7201-1131-0000-000	**221,60 €**
WS-01	**Sun and ball-impact protection hood**, 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information see last chapter!		

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

AFTF-20-Q (± 1,8 %)
with M12 connector



HYGRASGARD® **AFTF-20-Q**	On-wall humidity sensors and temperature sensors (± 1,8 %), *Premium* (**with M12 connector**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
AFTF-20-Q							
AFTF-20-I **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6121-2100-001	**315,96 €**
AFTF-20-I **Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6122-2100-001	**365,78 €**
AFTF-20-U **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-6121-1100-001	**315,96 €**
AFTF-20-U **Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6122-1100-001	**365,78 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information see last chapter!		

HYGRASGARD® AFF-20
HYGRASGARD® AFTF-20

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



AFF-20 / AFTF-20 (± 1,8 %)
with cable gland

HYGRASGARD® **AFF-20**	On-wall humidity sensors (± 1.8 %), *Premium* (**with cable gland**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFF-20							
AFF-20-I	0...100 % RH	–	4... 20 mA	–		1201-7112-0000-201	**248,48 €**
AFF-20-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-7112-0400-201	**300,92 €**
AFF-20-U	0...100 % RH	–	0-10 V	–		1201-7111-0000-201	**248,48 €**
AFF-20-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7111-0400-201	**300,92 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

HYGRASGARD® **AFTF-20**	On-wall humidity and temperature sensors (± 1.8 %), *Premium* (**with cable gland**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFTF-20							
AFTF-20-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7112-1000-201	**272,77 €**
AFTF-20-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7112-1400-201	**322,62 €**
AFTF-20-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-201	**272,77 €**
AFTF-20-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-201	**322,62 €**
Housing variant:	Cable connection **with cable gland** (M12 connector see **AFTF-20-Q**)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information see last chapter!		

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable outdoor humidity and temperature sensor **HYGR**ASGARD® **AFTF-20-VA** (± 1.8 %) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with / without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

AFTF-20-VA
with cable gland



AFTF-20-VAQ
with M12 connector

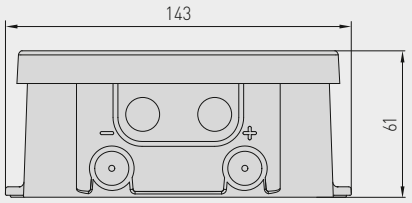


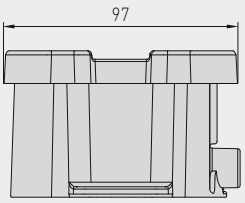
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	< 95 % RH, non-precipitating air
Deviation in humidity:	typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C**
Ambient temperature:	storage –35...+85 °C; operation –30...+80 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	made from stainless steel V2A (1.4301), Ø 16 mm, NL = 137 mm
Sensor protection:	**metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 7131609608 (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity
ACCESSORIES	(see table)

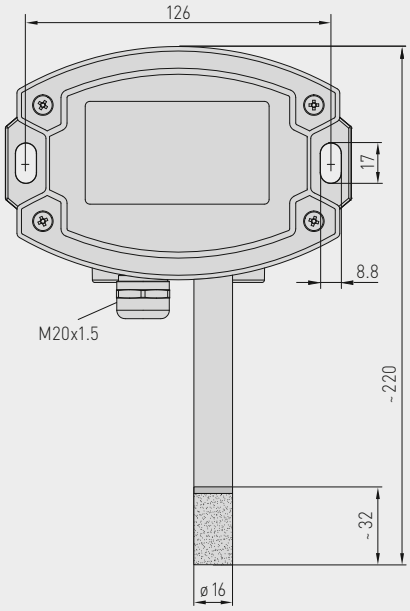
On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

Dimensional drawing **AFTF-20-VA**

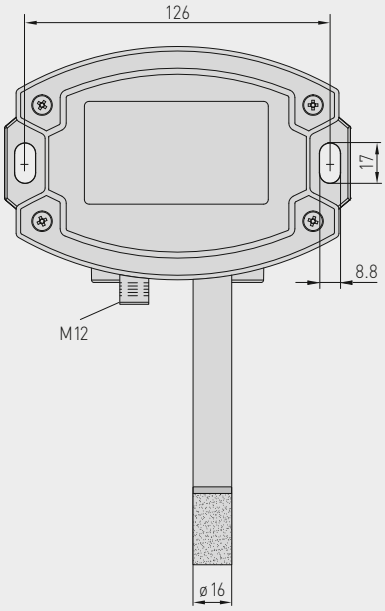




Housing with
cable gland

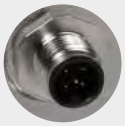


Housing with
M12 connector





SF-M
Metal sinter filter
(standard)



M12 connector
(male)

AFTF-20-VA
with cable gland
and display



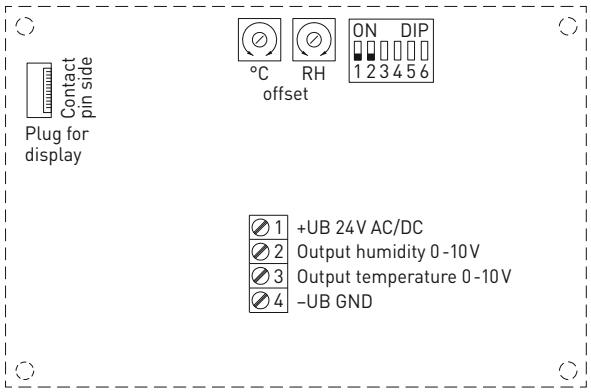
AFTF-20-VAQ
with M12 connector
and display



On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

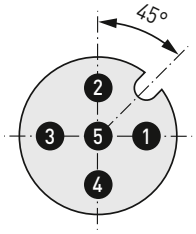
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Schematic diagram — **AFTF-xx-U** with / without display (Tyr 2)



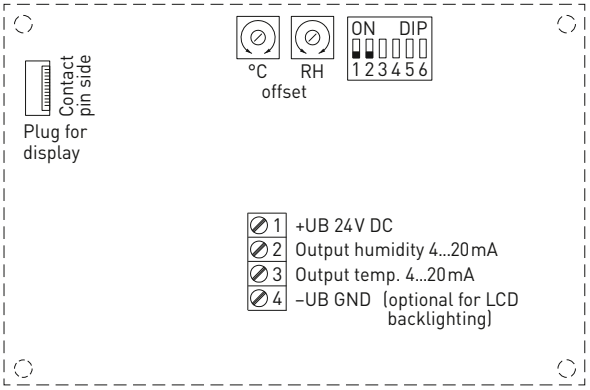
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) — **AFTF-xx-U**



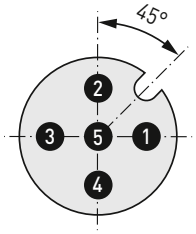
1 +UB 24V AC/DC
2 Output humidity 0-10V [% r.H.]
3 Output temperature 0-10V [°C]
4 –UB GND
5 Shield

Schematic diagram** — **AFTF-xx-I** with / without display (Tyr 2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) — **AFTF-xx-I**



1 +UB 24V DC
2 Output humidity 4...20mA [% r.H.]
3 Output temperature 4...20mA [°C]
4 –UB GND (optional for LCD backlighting)
5 Shield

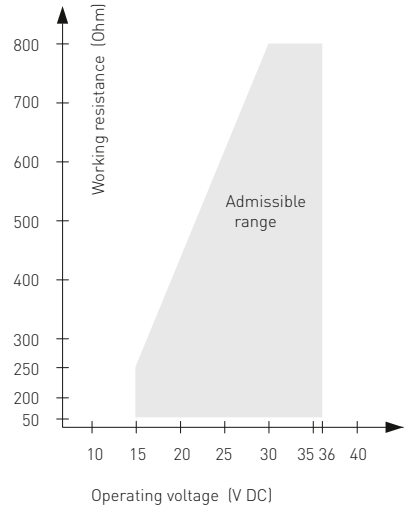
3- or 4-wire connection ** — **AFTF-xx-I (Transmitter)**

1 +UB 24V DC
2 Output humidity 4...20mA
3 Output temp. 4...20mA
4 –UB-GND (optional for backlighting)

4-wire connection — **AFTF-xx-U**

1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Output temperature 0-10V
4 –UB-GND

Load resistance diagram 4..20mA — **AFF-xx-I AFTF-xx-I**



Connection**:
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

AFTF-20-VAQ
with display, hinged



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

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AFTF-20-VAQ
with M12 connector



HYGRASGARD® **AFTF-20-VAQ**	On-wall humidity sensors and temperature sensors (± 1,8 %), *ID* (**with M12 connector**)						
Type / WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
AFTF-20-VAQ						**(active)**	
AFTF-20-I VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6181-2100-001	**682,23 €**
AFTF-20-I VA**Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6182-2100-001	**842,29 €**
AFTF-20-U VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-6181-1100-001	**682,23 €**
AFTF-20-U VA**Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6182-1100-001	**842,29 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information see last chapter!		

On-wall humidity sensors and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



AFTF-20-VA
with cable gland

HYGRASGARD® **AFTF-20-VA**	On-wall humidity sensors and temperature sensors (± 1,8 %), *ID* (**with cable gland**)						
Type /WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
AFTF-20-VA							
AFTF-20-I VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-6181-2200-001	**642,54 €**
AFTF-20-I VA **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2200-001	**802,61 €**
AFTF-20-U VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-6181-1200-001	**642,54 €**
AFTF-20-U VA **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	2003-6182-1200-001	**802,61 €**
Housing variant:	Cable connection **with cable gland**						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information see last chapter!		

HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

NEW

S+S REGELTECHNIK

Condensation-protected on-wall sensor **HYGR**ASREG® **AFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), optionally with / without display, for detecting relative humidity (0…100 % RH) and temperature (4 switchable measuring ranges, max. 0…+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4…20 mA.

The unit is specially designed for use in the **high humidity range** (95…99 % RH). A long-term stable, **digital humidity and temperature sensor** is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA	
Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100…500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4…20 mA) 1 changeover contact
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0…100 % RH
Deviation in humidity:	typically ± 3.0 % (30…70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10 V for U variant; 4…20 mA for I variant
TEMPERATURE	
Temperature measuring range:	**Multi-range switching with 4 switchable measuring ranges** (see table) 0…+50 °C (default); –20…+50 °C; –20…+80 °C; 0…+100 °C
Deviation in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10 V for U variant; 4…20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	**Cable gland,** plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Housing:	Plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	made of stainless steel **V2A** (1.4301), Ø 16 mm, NL = 55 mm (combined humidity and temperature measuring element) **and** of stainless steel **V4A** (1.4571), Ø 6 mm, NL = 65 mm (second, separate temperature measuring element)
Process connection:	via screws
Ambient temperature:	storage –20…+50 °C; operation –20…+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (as per EN 60 730)
Protection type:	**IP 65** (as per EN 60 529) housing, IP 20 sensor technology
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3 K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

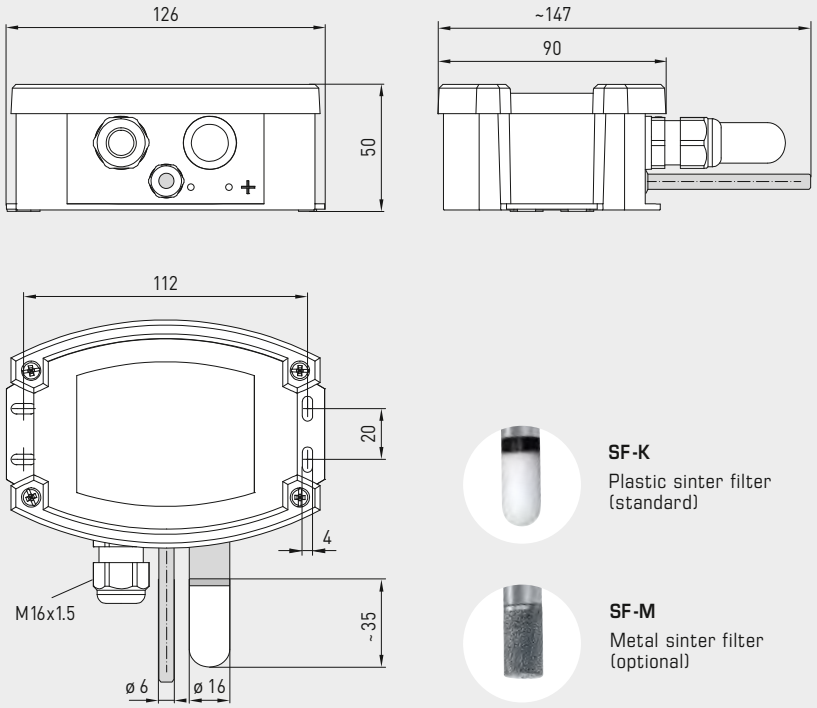
NEW

HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

Dimensional drawing
[mm]

AFTF-35



SF-K
Plastic sinter filter
(standard)

SF-M
Metal sinter filter
(optional)

AFTF-35
with plastic sinter filter
(standard)



Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table
MR: –20...+50 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+100 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

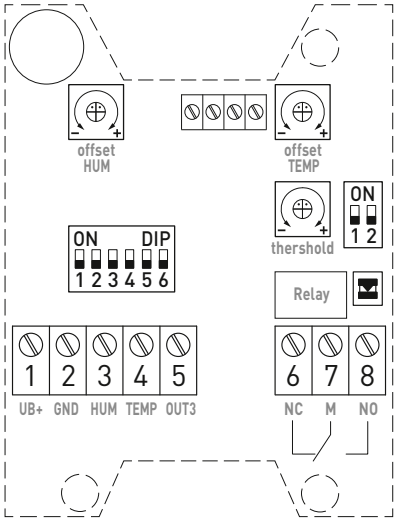
HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

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Schematic diagram **AFTF-35-xx**

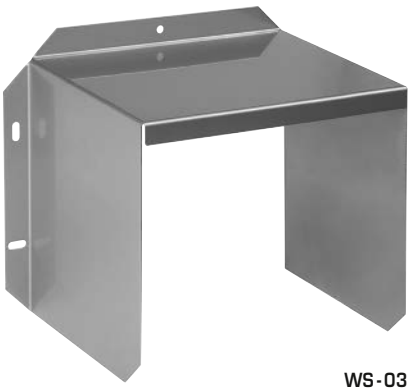


Connecting diagram **AFTF-35-I**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 4...20mA
4	Output Temperature 4...20mA
5	Output altern. parameters 4...20mA
6	NC Normally Closed
7	M Common
8	NO Normally Open

Connecting diagram **AFTF-35-U**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 0-10V
4	Output Temperature 0-10V
5	Output altern. parameters 0-10V
6	NC Normally Closed
7	M Common
8	NO Normally Open



WS-03
Weather and sun protection hood

ON DIP
1 2 3 4 5 6

Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
–20...+50 °C	**ON**	OFF
–20...+80 °C	OFF	**ON**
0...+100 °C	**ON**	**ON**

Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(a.F.) **0...20 g/m³** (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	**ON**	OFF	OFF
(MV) 0...20 g/kg	OFF	**ON**	OFF
(MV) 0...25 g/kg	**ON**	**ON**	OFF
(TP) 0...+50 °C	OFF	OFF	**ON**
(TP) –20...+50 °C	**ON**	OFF	**ON**
(FKT) –30...+30 °C	OFF	**ON**	**ON**
(FKT) –20...+50 °C	**ON**	**ON**	**ON**

(a.F.) = absolute humidity [g/m³]
(MV) = mixture ratio [g/kg]
(TP) = dew point [°C]
(FKT) = wet bulb temperature [°C]

Note: For factory service only, it must be set to "OFF" during operation!	DIP 6
Operation (default)	OFF

ON
1 2

Relay function assignment	DIP 1	DIP 2
inactive (default)	OFF	OFF
Humidity	**ON**	OFF
Temperature	OFF	**ON**
alternative parameters	**ON**	**ON**



HYGRASREG® **AFTF-35**	Condensation-protected on-wallsensor for high humidity						
Type / WG02	**Measuring Range** Humidity	Temperature	**Output active**	**Output switching**	**Display**	**Item No.**	**Price**
AFTF-35-I						**I variant**	
AFTF-35-I/W	**0...100 %RH** 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) –20...+50 °C (TP) –30...+30 °C (FKT) –20...+50 °C (FKT)	**0...+50 °C** –20...+50 °C –20...+80 °C 0...+100 °C	3x **4...20 mA**	1x Changeover contact		1201-714B-1000-000	**738,13 €**
AFTF-35-I/W **LCD**	(as above)	(as above)	3x **4...20 mA**	1x Changeover contact	■	1201-714B-1200-000	**843,57 €**
AFTF-35-U						**U variant**	
AFTF-35-U/W	(as above)	(as above)	3x **0-10 V**	1x Changeover contact		1201-714A-1000-000	**738,13 €**
AFTF-35-U/W **LCD**	(as above)	(as above)	3x **0-10 V**	1x Changeover contact	■	1201-714A-1200-000	**843,57 €**
Note	**Alternative parameters** are calculated internally from the measured variables, which are retrievable via the active output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)						
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**43,60 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)					7100-0040-6000-000	**46,08 €**
	for further information see see chapter Accessories!						

HYGRASGARD® AAVTF

On-wall outdoor humidity sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

S+S REGELTECHNIK

The universal humidity sensors **HYGR**ASGARD® **AAVTF** are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], or enthalpy [kJ / kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100 % RH, for output 2 temperature measuring range 0...+50 °C. Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices must be operated in pollutant-free, non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are suitable for wall mounting.

AAVTF
with plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



TECHNICAL DATA

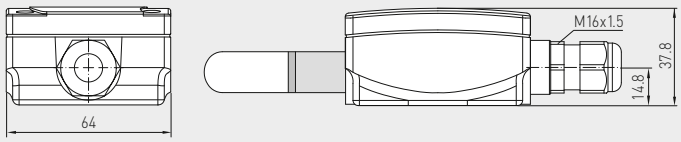
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor**, low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	**multi-range switching with** **8 switchable measuring ranges** (see table) 0...100 % RH (default)
Operating range, humidity:	10...95 % RH, without formation of dew
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+80 °C; –35...+75 °C; –35...+35 °C
Operating range, temperature:	–35...+85 °C sensors
Deviation, temperature:	typically ± 0.6 K at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage –35...+85 °C; operation –30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Typ 1 without display) 72 x 64 x 43.3 mm (Typ 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Typ 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables
ACCESSORIES	see last chapter

On-wall outdoor humidity sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

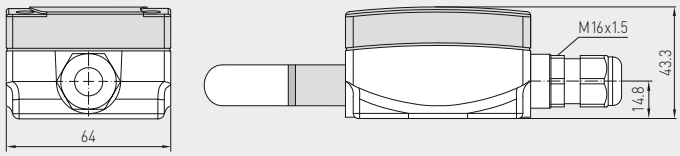
Dimensional drawing

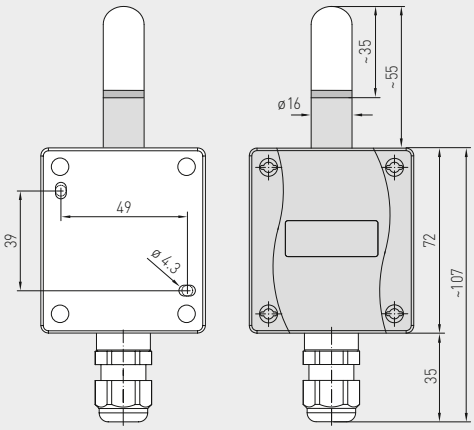
AAVTF

without display



with display





with **plastic** sinter filter (standard)



M12 connector
(optional on request)

AAVTF
with display and plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table
MR: 0...100 % RH

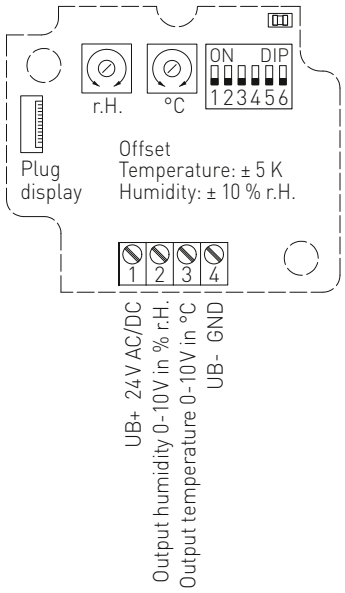
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® AAVTF

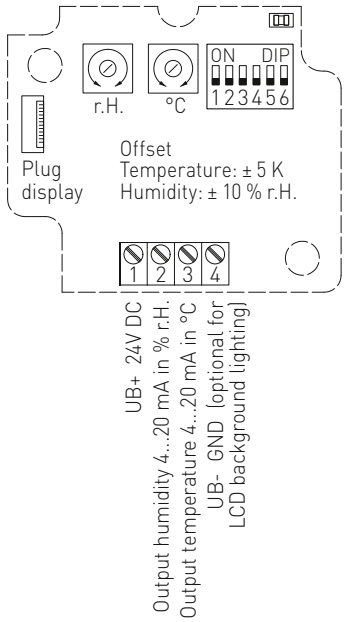
On-wall outdoor humidity sensors (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

S+S REGELTECHNIK

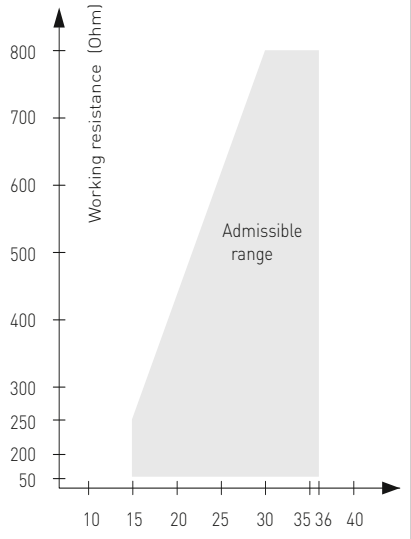
Schematic diagram **AAVTF-U** with display



Schematic diagram **AAVTF-I** with display



Load resistance diagram **AAVTF-I**
4.. 20 mA



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
–20...+80 °C	**ON**	OFF
–35...+75 °C	OFF	**ON**
–35...+35 °C	**ON**	**ON**

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
RH: **0...100 %** (default)	OFF	OFF	OFF
MR: 0...50 g / kg	**ON**	OFF	OFF
MR: 0...80 g / kg	OFF	**ON**	OFF
A.H.: 0...50 g / m³	OFF	OFF	**ON**
A.H.: 0...80 g / m³	**ON**	**ON**	OFF
DP: 0...+50 °C	**ON**	OFF	**ON**
DP: –20...+80 °C	OFF	**ON**	**ON**
ENT.: 0...85 kJ / kg	**ON**	**ON**	**ON**

Possible parameters:

(RH) = relative humidity in %
(MR) = mixture ratio in g / kg
(A.H.) = absolute humidity in g / m³
(DP) = dew point in °C
(ENT.) = enthalpy in kJ / kg

Service display / output (adjustable)	DIP 6
Display °C and % RH, output of set measurements via DIP 1-5 (service mode for setting °C and % RH)	**ON**
Display and output of set measurements via DIP 1-5	OFF

AAVTF
with display



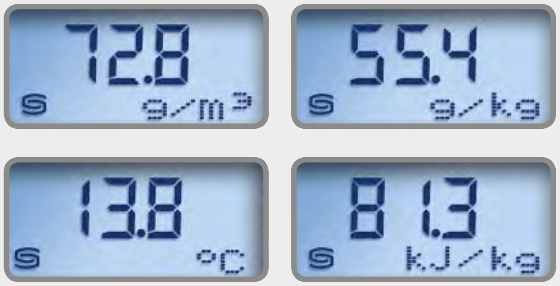
WS-04
Weather and sun protection hood (optional)



Display Standard — **AAVTF Display**



Displays alternative output variables — **AAVTF Display**



Displays service mode — **AAVTF Display**



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C
Relative humidity in % RH

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g / m³
Dew point in °C
Mixture ratio in g / kg
Enthalpy in kJ / kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).

HYGRASGARD® AAVTF On-wall outdoor humidity sensors (± 2.0 %)

Type / WG01	Measuring Range Humidity		Temperature		Output Humidity	Display Temperature		Item No.	Price
AAVTF-I	(switchable)		(switchable)					**I-variant**	
AAVTF-I	0 ...100 % RH	(default)	0...+50 °C	(default)	4...20 mA	4...20 mA		1201-1162-6000-028	**211,75 €**
	0...50 g / kg	(MR)	–20...+80 °C						
	0...80 g / kg	(MR)	–35...+75 °C						
	0...50 g / m³	(A.H.)	–35...+35 °C						
	0...80 g / m³	(A.H.)							
	0...+50 °C	(DP)							
	–20...+80 °C	(DP)							
	0...85 kJ / kg	(ENT.)							
AAVTF-I **LCD**	(8x as above)		(4x as above)		4...20 mA	4...20 mA	■	1201-1162-6200-028	**263,08 €**
AAVTF-U								**U-variant**	
AAVTF-U	(8x as above)		(4x as above)		0-10 V	0-10 V		1201-1161-6000-028	**211,75 €**
AAVTF-U **LCD**	(8x as above)		(4x as above)		0-10 V	0-10 V	■	1201-1161-6200-028	**263,08 €**
Extra charge:	Other non-standard ranges optional								**153,95 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101							on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
WS-01	**Sun and ball-impact protection hood**, 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active / passive output

S+S REGELTECHNIK

Calibratable duct humidity-/temperature sensor **HYGR**ASGARD® **KFF-SD/KFTF-SD** (± 2,0 %), with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic with snap-on lid, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

Calibratable duct humidity-/temperature sensor **HYGR**ASGARD® **KFF/KFTF** (± 2,0 %) or **KFF-20/KFTF-20** (± 1,8 %), with plastic sinter filter (optional metal sinter filter), housing made of impact-resistant plastic with quick-locking screws, optionally with / without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permissible air humidity:	< 95 % RH, non-precipitating air
Deviation, humidity:	**KFF / KFTF / KFF-SD / KFTF-SD:** typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 % **KFF-20 / KFTF-20:** typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output, humidity:	0 -10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 -10 V for U variant; 4...20 mA for I variant; **KFTF-Uxx** (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	**KFF-xx / KFTF-xx** (without display): 72 x 64 x 37.8 mm (Typ 1/01) **KFF / KFTF** (with display): 72 x 64 x 43.3 mm (Typ 1) **KFF-20 / KFTF-20** (with display): 26 x 90 x 50 mm (Typ 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (on request, optional **stainless steel V2A** (1.4301), Ø 16 mm)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**KFF-SD / KFTF-SD** **IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Typ 01) **KFF-xx / KFTF-xx** **IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Typ 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** for displaying ACTUAL temperature and / or ACTUAL humidity **KFF / KFTF** (Typ 1)**:** two-line, cutout approx. 36 x 15 mm (W x H) **KFF-20 / KFTF-20** (Typ 2)**:** three-line, cutout approx. 70 x 40 mm (W x H)
ACCESSORIES	see last chapter

SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)



Protective tube stainless steel
(optional on request)

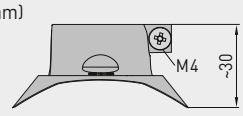


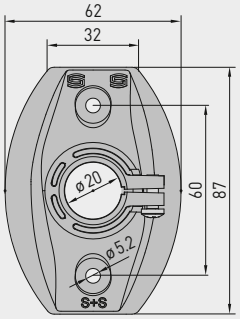
M12 connector
(optional)

MFT-20-K
Mounting flange, plastic



Dimensional drawing (mm) **MFT-20-K**



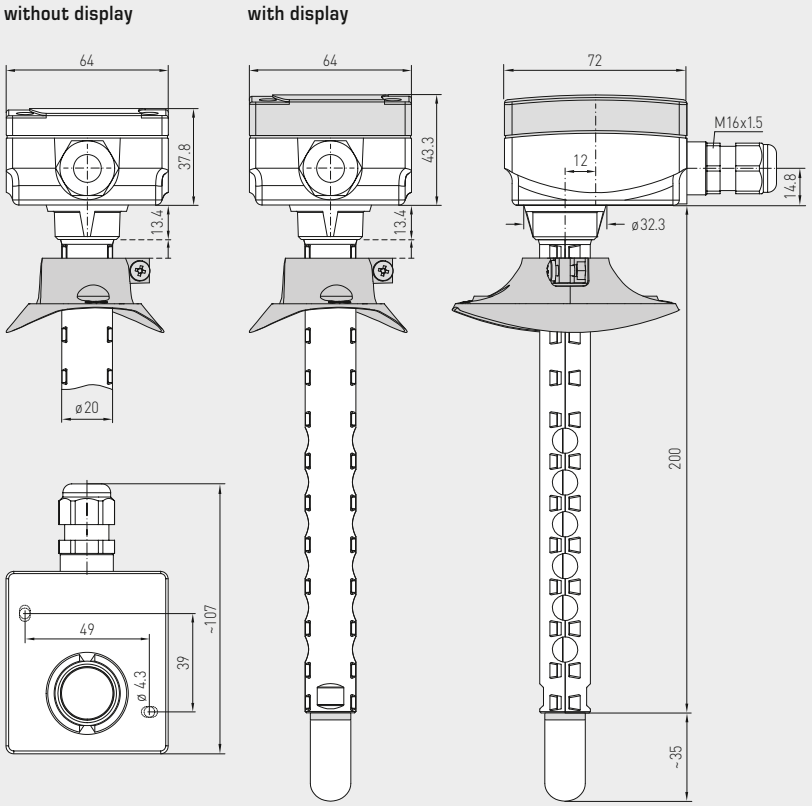


HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active/passive output

Dimensional drawing
[mm]

KFF/KFTF with/without display
KFF-SD/KFTF-SD without display
KFF-20/KFTF-20 without display



KFF-SD/KFTF-SD (± 2,0 %)
with snap-on lid
(IP 54)

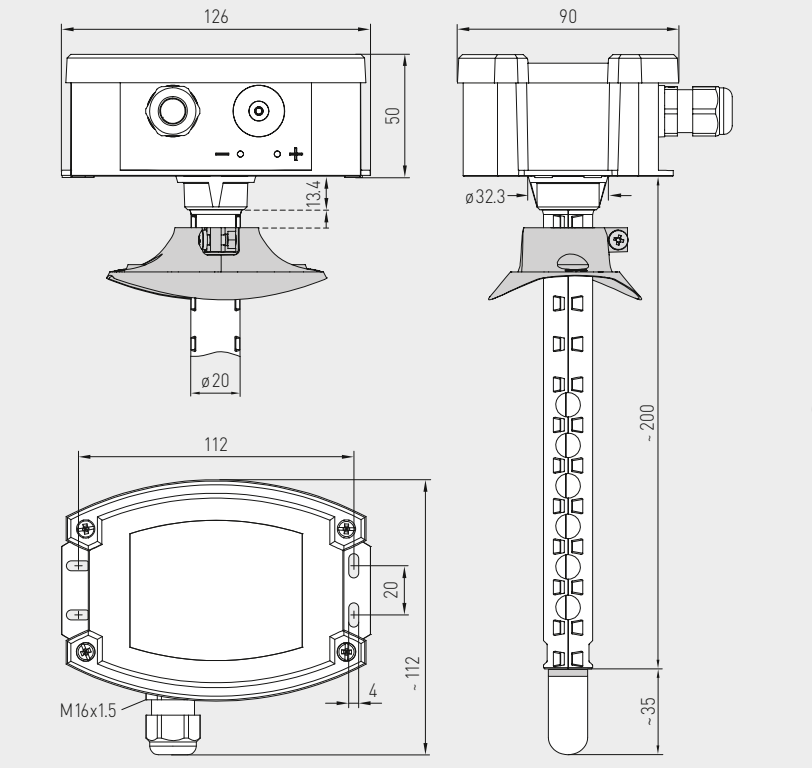


KFF/KFTF (± 2,0 %)
KFF-20/KFTF-20 (± 1,8 %)
without display
(IP 65)



Dimensional drawing
[mm]

KFF-20/KFTF-20 with display



KFF/KFTF (± 2,0 %)
with display
(IP 65)



KFF-20/KFTF-20 (± 1,8 %)
with display
(IP 65)

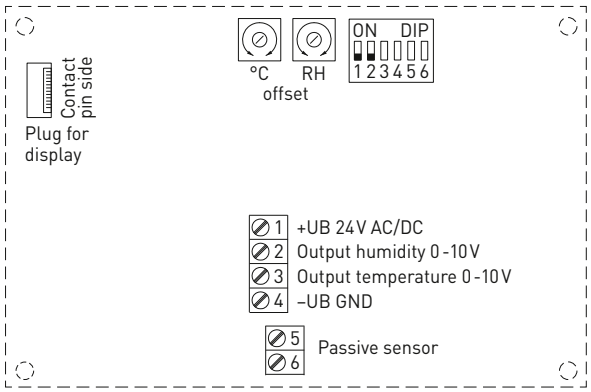


HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active/passive output

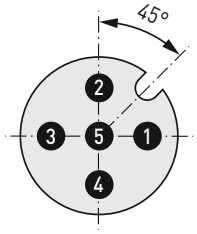
S+S REGELTECHNIK

Schematic diagram **KFTF-20-U** with display (Tyr2)



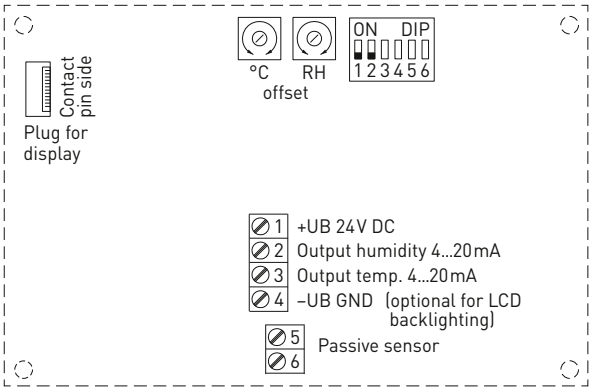
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-U**



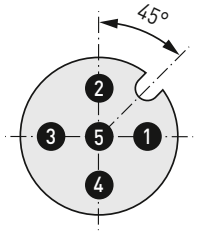
1 +UB 24V AC/DC
2 Output humidity 0-10V [% r.H.]
3 Output temperature 0-10V [°C]
4 –UB GND
5 Shield

Schematic diagram **KFTF-20-I** with display (Tyr2)



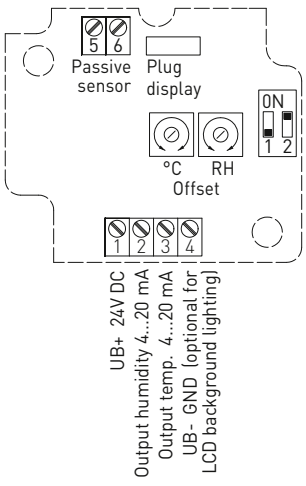
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-I**

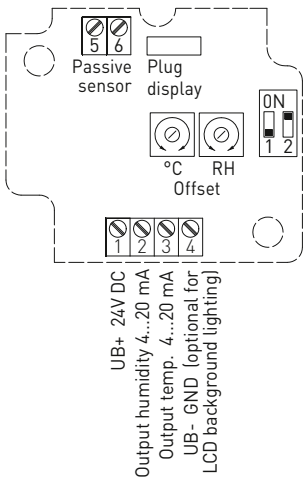


1 +UB 24V DC
2 Output humidity 4...20mA [% r.H.]
3 Output temperature 4...20mA [°C]
4 –UB GND (optional for LCD backlighting)
5 Shield

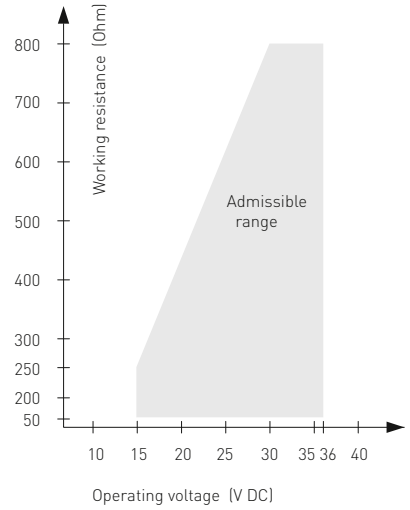
Schematic diagram **KFTF-xx-U** with / without display (Tyr1)



Schematic diagram **KFTF-xx-I** with / without display (Tyr1)



Load resistance diagram 4..20 mA **KFF-xx-I** **KFTF-xx-I**



HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors (± 1.8 % / ± 2.0 %), including mounting flange, calibratable, with multi-range switching and active/passive output

3-wire connection — **KFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection * — **KFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Free
4	–UB-GND (optional for backlighting)

4- or 6-wire connection — **KFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

4-wire connection — **KFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND

3- or 4-wire connection ** — **KFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Output temp. 4...20mA
4	–UB-GND (optional for backlighting)

4- or 6-wire connection — **KFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Output temp. 4...20mA
4	–UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Connection*:
2-wire connection for devices with/without display (not illuminated)
3-wire connection for devices with illuminated display

Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% **RH**	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® KFF-SD
HYGRASGARD® KFTF-SD

Duct humidity and temperature sensors (± 2.0 %), including mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

KFF-SD / KFTF-SD
with snap-on lid
(IP 54)



HYGRASGARD® KFF-SD **HYGRASGARD® KFTF-SD**	Duct humidity sensors (± 2.0 %), *Standard* Duct humidity and temperature sensors (± 2.0 %), *Standard*					
Type / WG01B	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
KFF-SD					**IP 54**	
KFF-SD-I	0...100 % RH	–	4...20 mA	–	1201-3182-0000-029	**167,18 €**
KFF-SD-U	0...100 % RH	–	0-10 V	–	1201-3181-0000-029	**167,18 €**
KFTF-SD					**IP 54**	
KFTF-SD-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-3182-1000-029	**171,76 €**
KFTF-SD-U	0...100 % RH	(4x as above)	0-10 V	0-10 V	1201-3181-1000-029	**171,76 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see chapter Accessories!		

KFF / KFTF
with quick-locking screws
(IP 65)







HYGRASGARD® KFF **HYGRASGARD® KFTF**	Duct humidity sensors (± 2.0 %), *Standard* Duct humidity and temperature sensors (± 2.0 %), *Standard*						
Type / WG01	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
KFF						**IP 65**	
KFF-I	0...100 % RH	–	4...20 mA	–		1201-3112-0000-029	**179,64 €**
KFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-3112-0200-029	**232,09 €**
KFF-U	0...100 % RH	–	0-10 V	–		1201-3111-0000-029	**179,64 €**
KFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-3111-0200-029	**232,09 €**
KFTF						**IP 65**	
KFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-029	**184,23 €**
KFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-3112-1200-029	**236,68 €**
KFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-029	**184,23 €**
KFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-3111-1200-029	**236,68 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	

HYGRASGARD® **KFTF-U xx**	Duct humidity and temperature sensors (± 2.0 %), *Standard* (passive temperature sensor)					
Type / WG01	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
KFTF-U xx	**Pt, Ni, LM235Z, NTC**			(active / **passive**)	**IP 65**	
KFTF-U Pt100	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + **Pt100**	1201-3111-2001-029	**191,44 €**
KFTF-U Pt1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Pt1000**	1201-3111-2005-029	**192,10 €**
KFTF-U Ni1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000**	1201-3111-2009-029	**192,75 €**
KFTF-U NiTK	0...100 % RH	(4x as above)	0-10 V	0-10 V + **Ni1000TK5000**	1201-3111-2010-029	**193,79 €**
KFTF-U LM235Z	0...100 % RH	(4x as above)	0-10 V	0-10 V + **LM235Z**, 10mV / K	1201-3111-2021-029	**192,49 €**
KFTF-U NTC1,8K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 1,8 kOhm**	1201-3111-2012-029	**192,75 €**
KFTF-U NTC10K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 10 kOhm**	1201-3111-2015-029	**191,57 €**
KFTF-U NTC20K	0...100 % RH	(4x as above)	0-10 V	0-10 V + **NTC 20 kOhm**	1201-3111-2016-029	**191,57 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	

HYGRASGARD® KFTF-20-Q

Duct humidity and temperature sensors (± 1.8 %), incl. mounting flange, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

KFTF-20-Q
with M12 connector,
with display (Tyr2)





KFTF-20-Q
with M12 connector,
without display (Tyr1)



HYGRASGARD® KFTF-20-Q	Duct humidity and temperature sensors (± 1,8 %), *Premium* (**with M12 connector**)						
Type / WG02	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
KFTF-20-Q						**IP 65**	
KFTF-20-I **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-4151-2100-001	**315,96 €**
KFTF-20-I **Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-4172-2100-001	**365,78 €**
KFTF-20-U **Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-4151-1100-001	**315,96 €**
KFTF-20-U **Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-4172-1100-001	**365,78 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see chapter Accessories!		

HYGRASGARD® KFF-20
HYGRASGARD® KFTF-20

Duct humidity and temperature sensors (± 1.8 %), incl. mounting flange, calibratable, with multi-range switching and active output

KFF-20 / KFTF-20
with cable gland,
with display (Tyr2)





KFF-20 / KFTF-20
with cable gland,
without display (Tyr1)



HYGRASGARD® KFF-20
Duct humidity sensors (± 1,8 %), *Premium* (with cable gland)

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
KFF-20						IP 65	
KFF-20-I	0...100 % RH	–	4... 20 mA	–		1201-3112-0000-030	**248,48 €**
KFF-20-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-8112-0400-030	**300,92 €**
KFF-20-U	0...100 % RH	–	0-10 V	–		1201-3111-0000-030	**248,48 €**
KFF-20-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-8111-0400-030	**300,92 €**
Housing variant:	Cable connection **with cable gland** (M12 connector on request)						

HYGRASGARD® KFTF-20
Duct humidity and temperature sensors (± 1,8 %), *Premium* (with cable gland)

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
KFTF-20						IP 65	
KFTF-20-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-3112-1000-030	**272,77 €**
KFTF-20-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-8112-1400-030	**322,62 €**
KFTF-20-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-030	**272,77 €**
KFTF-20-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-8111-1400-030	**322,62 €**
Housing variant:	Cable connection **with cable gland** (M12 connector see **KFTF-20-Q**)						

ACCESSORIES

SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see chapter Accessories!		

HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Calibratable humidity and temperature sensor **HYGR**ASGARD® **KFTF-20-VA** (± 1.8 %) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with / without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

KFTF-20-VA
with cable gland



KFTF-20-VAQ
with M12 connector

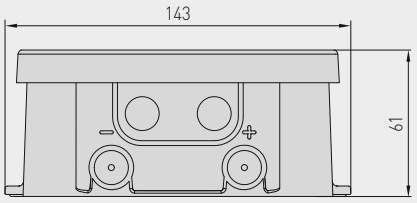


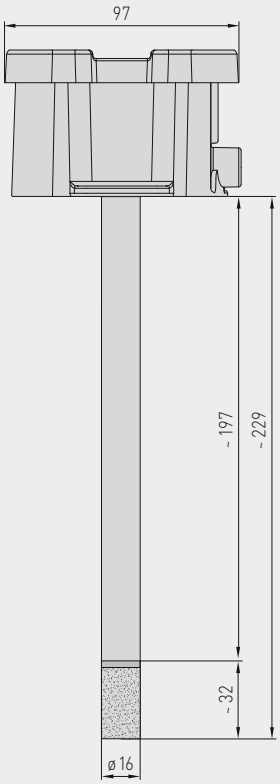
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant, see load resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	< 95 % RH, non-precipitating air
Deviation in humidity:	typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	**multi-range switching** (see table) **–35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C**
Ambient temperature:	storage –35...+85 °C; operation –30...+80 °C, non-precipitating
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connection diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Protective tube:	**made from stainless steel V2A** (1.4301), Ø 16 mm, NL = 197 mm
Sensor protection:	**metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi 2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity
ACCESSORIES	(see table)

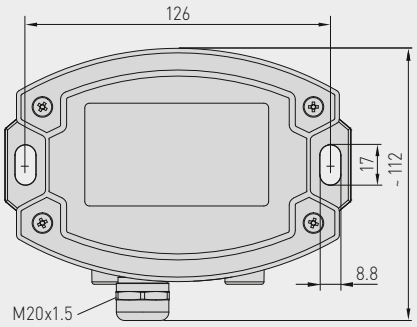
Dimensional drawing
[mm]

KFTF-20-VA

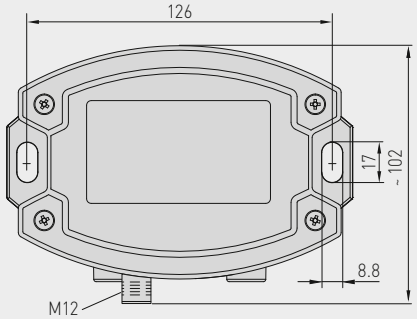




Housing with
cable gland

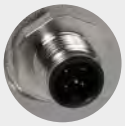


Housing with
M12 connector





SF-M
Metal sinter filter
(standard)



M12 connector
(male)

KFTF-20-VA
with cable gland
and display



KFTF-20-VAQ
with M12 connector
and display

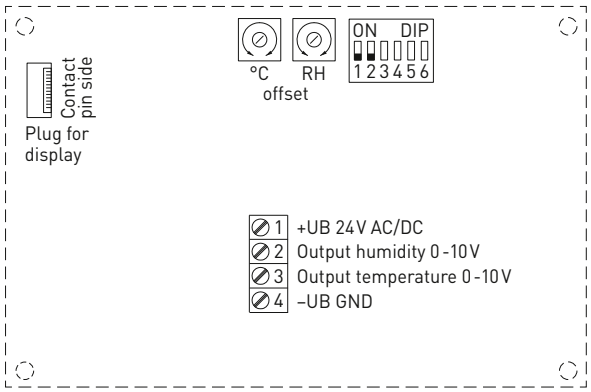


HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

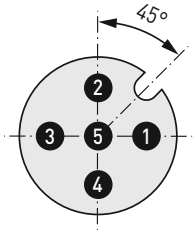
S+S REGELTECHNIK

Schematic diagram **KFTF-xx-U**



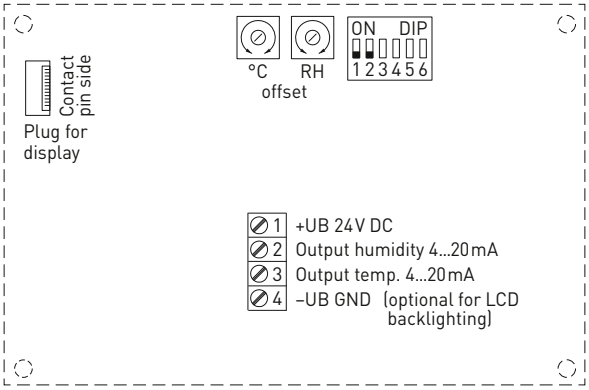
DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-U**



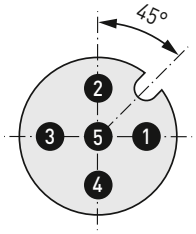
1 +UB 24V AC/DC
2 Output humidity 0-10V [% r.H.]
3 Output temperature 0-10V [°C]
4 –UB GND
5 Shield

Schematic diagram **KFTF-xx-I**



DIP 3, 4, 5, 6 are not assigned!

Pin assignment (M12) **KFTF-xx-I**



1 +UB 24V DC
2 Output humidity 4...20mA [% r.H.]
3 Output temperature 4...20mA [°C]
4 –UB GND (optional for LCD backlighting)
5 Shield

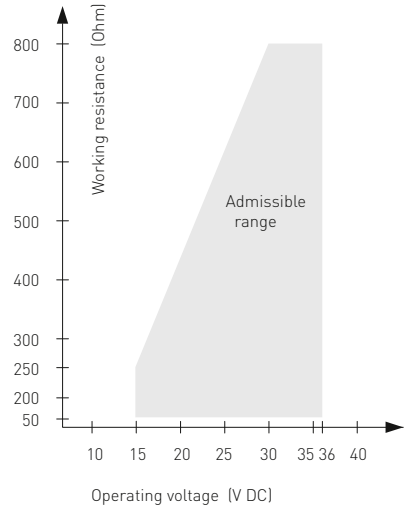
3- or 4-wire connection ** **KFTF-xx-I (Transmitter)**

1 +UB 24V DC
2 Output humidity 4...20mA
3 Output temp. 4...20mA
4 –UB-GND (optional for backlighting)

4-wire connection **KFTF-xx-U**

1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Output temperature 0-10V
4 –UB-GND

Load resistance diagram 4..20mA **KFTF-xx-I**



Connection**:
3-wire connection for devices with/without display (not illuminated)
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

KFTF-20-VAQ
with display, hinged



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

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KFTF-20-VAQ
with M12 connector



HYGRASGARD® **KFTF-20-VAQ**	Duct humidity and temperature sensors (± 1,8 %), *ID* **(with M12 connector)**						
Type / WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display** ● = **Q**	**Item No.**	**Price**
KFTF-20-VAQ							
KFTF-20-I VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-4161-2100-001	**682,23 €**
KFTF-20-I VA**Q LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-4162-2100-001	**842,29 €**
KFTF-20-U VA**Q**	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-4161-1100-001	**682,23 €**
KFTF-20-U VA**Q LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-4162-1100-001	**842,29 €**
Housing variant "Q":	Cable connection **with M12 connector** (male, **5-pin**, A-code)						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see chapter Accessories!		

Duct humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output



KFTF-20-VA
with cable gland

HYGRASGARD® **KFTF-20-VA**	Duct humidity and temperature sensors (± 1,8 %), *ID* (**with cable gland**)						
Type / WG02I	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item No.**	**Price**
KFTF-20-VA							
KFTF-20-I VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-4161-2200-001	**642,54 €**
KFTF-20-I VA **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2200-001	**802,61 €**
KFTF-20-U VA	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-4161-1200-001	**642,54 €**
KFTF-20-U VA **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	2003-4162-1200-001	**802,61 €**
Housing variant:	Cable connection **with cable gland**						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
	For further information, see chapter Accessories!		

HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

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Condensation-protected ductsensor **HYGR**ASREG® **KFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), optionally with / without display, for detecting relative humidity (0...100 % RH) and temperature (4 switchable measuring ranges, max. 0...+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA.

The unit is specially designed for use in the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

SF-K
Plastic sinter filter (standard)



SF-M
Metal sinter filter (optional)

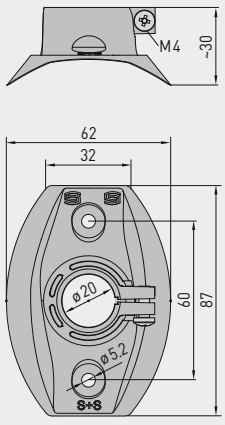


TECHNICAL DATA	
Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100...500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4...20 mA) 1 changeover contact
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Deviation in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Temperature measuring range:	**multi-range switching with 4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+50 °C; –20...+80 °C; 0...+100 °C
Deviation in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland,** plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Ambient temperature:	storage –20...+50 °C; operation –20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing, IP 20 sensor technology
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3 K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

MFT-20-K
Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**



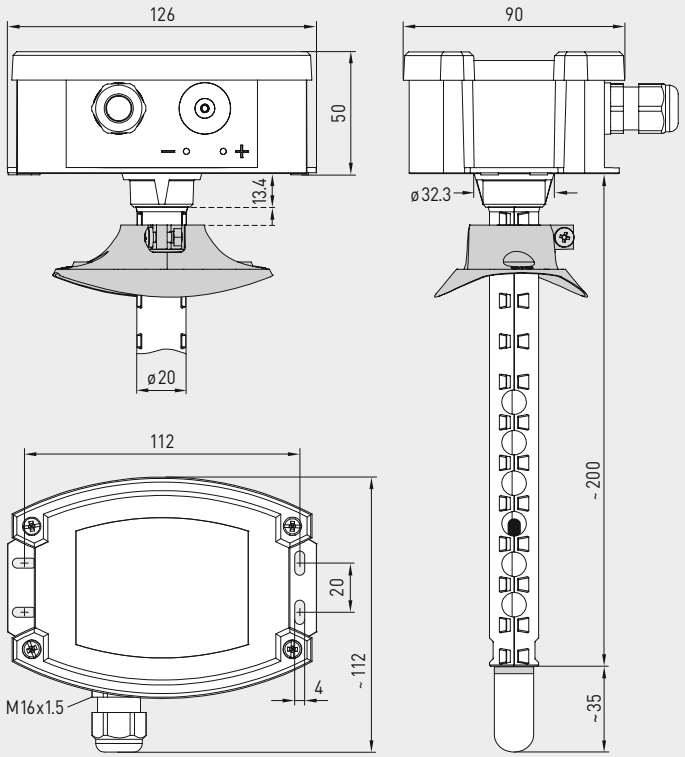
NEW

HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Dimensional drawing
[mm]

KFTF-35



KFTF-35
with plastic sinter filter
(standard)



Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table
MR: –20...+50 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+100 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

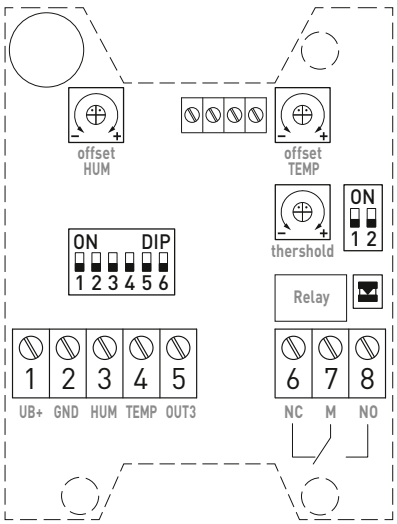
HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

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Schematic diagram **KFTF-35-xx**



Connecting diagram **KFTF-35-I**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 4...20mA
4	Output Temperature 4...20mA
5	Output altern. parameters 4...20mA
6	NC Normally Closed
7	M Common
8	NO Normally Open

Connecting diagram **KFTF-35-U**

1	+UB 24V AC/DC
2	–UB GND
3	Output Humidity 0-10V
4	Output Temperature 0-10V
5	Output altern. parameters 0-10V
6	NC Normally Closed
7	M Common
8	NO Normally Open

ON DIP
1 2 3 4 5 6

Measuring ranges temperature	**DIP 1**	**DIP 2**
0...+50 °C (default)	OFF	OFF
–20...+50 °C	**ON**	OFF
–20...+80 °C	OFF	**ON**
0...+100 °C	**ON**	**ON**

Measuring ranges alternative parameters	**DIP 3**	**DIP 4**	**DIP 5**
(a.F.) **0...20 g/m³** (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	**ON**	OFF	OFF
(MV) 0...20 g/kg	OFF	**ON**	OFF
(MV) 0...25 g/kg	**ON**	**ON**	OFF
(TP) 0...+50 °C	OFF	OFF	**ON**
(TP) –20...+50 °C	**ON**	OFF	**ON**
(FKT) –30...+30 °C	OFF	**ON**	**ON**
(FKT) –20...+50 °C	**ON**	**ON**	**ON**

(a.F.) = absolute humidity [g/m³]
(MV) = mixture ratio [g/kg]
(TP) = dew point [°C]
(FKT) = wet bulb temperature [°C]

Note: For factory service only, it must be set to "OFF" during operation!	**DIP 6**
Operation (default)	OFF

ON
1 2

Relay function assignment	**DIP 1**	**DIP 2**
inactive (default)	OFF	OFF
Humidity	**ON**	OFF
Temperature	OFF	**ON**
alternative parameters	**ON**	**ON**

Condensation-protected duct humidity and temperature sensor for "high humidity", relative / absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



HYGRASREG® **KFTF-35**	Condensation-protected duct sensor for high humidity						
Type / WG02	**Measuring Range** Humidity	Temperature	**Output active**	**Output switching**	**Display**	**Item No.**	**Price**
KFTF-35-I						**I variant**	
KFTF-35-I/W	**0...100 %RH** 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) –20...+50 °C (TP) –30...+30 °C (FKT) –20...+50 °C (FKT)	**0...+50 °C** –20...+50 °C –20...+80 °C 0...+100 °C	3x **4...20 mA**	1x Changeover contact		1201-814B-1000-000	**738,13 €**
KFTF-35-I/W LCD	(as above)	(as above)	3x **4...20 mA**	1x Changeover contact	■	1201-814B-1200-000	**843,57 €**
KFTF-35-U						**U variant**	
KFTF-35-U/W	(as above)	(as above)	3x **0-10 V**	1x Changeover contact		1201-814A-1000-000	**738,13 €**
KFTF-35-U/W LCD	(as above)	(as above)	3x **0-10 V**	1x Changeover contact	■	1201-814A-1200-000	**843,57 €**
Optional:	shortened protection tube **PLEUROFORM**™ NL = 100 mm					on request	
Note	**Alternative parameters** are calculated internally from the measured variables, which are retrievable via the active output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)						
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**43,60 €**
	for further information see see chapter Accessories!						

HYGRASGARD® KAVTF

Kanal-Außenfeuchtefühler (± 2,0 %), inkl. Montageflansch, für Mischungsverhältnis, relative / absolute Feuchte, Taupunkt, Enthalpie (umschaltbar) und Temperatur, mit Mehrbereichsumschaltung und aktivem Ausgang

S+S REGELTECHNIK

Die universellen Feuchtefühler **HYGR**ASGARD® **KAVTF** mit 6 Ausgangsgrößen dienen zur Ermittlung diverser Messgrößen der Feuchtemesstechnik. Gemessen werden die relativen Feuchte und die Temperatur der Umgebungsluft. Aus diesen Messgrößen werden intern verschieden Kenngrößen berechnet.

Bei der Geräteversion x-U stehen zwei Ausgänge 0-10 V, bei der Version x-I zwei Ausgänge 4...20 mA zur Verfügung. Hierbei können per DIP-Schalter die Ausgangsgrößen für die Ausgänge festgelegt werden. Wählbar sind für den Ausgang 1 relative Feuchte [% RH], absolute Feuchte [g/m³], Mischungsverhältnis [g/kg], Taupunkttemperatur [°C] oder Enthalpie [kJ/kg] (unter Vernachlässigung des atm. Luftdruckes). Am Ausgang 2 sind vier verschiedene Messbereiche für die Umgebungstemperatur [°C] wählbar. Der Auslieferzustand für Ausgang 1 ist die relative Feuchte 0...100 % RH, für den Ausgang 2 der Temperaturmessbereich 0...+50 °C.

Durch die unterschiedlichen Konfigurationsmöglichkeiten können zahlreiche Mess- und Regelaufgaben durch nur ein Gerät gelöst werden. Die Geräte sind in schadstofffreier, nicht kondensierender Luft ohne Unter- bzw. Überdruck an der Sensorik zu betreiben. Einsatzgebiete sind bspw. die Medizintechnik, die Kältetechnik, die Klima- und Reinraumtechnik. Die Fühler sind für die Kanalmontage geeignet.

TECHNISCHE DATEN

Spannungsversorgung:	24 V AC (± 20 %) und 15...36 V DC bei U-Variante 15...36 V DC bei I-Variante, bürdenabhängig, Restwelligkeit stabilisiert ± 0,3 V
Bürde:	R_a (Ohm) = (U_b -14 V) / 0,02 A bei I-Variante
Lastwiderstand:	R_L > 5 kOhm bei U-Variante
Leistungsaufnahme:	< 1 W bei 24 V DC; < 2 VA bei 24 V AC
Sensoren:	**digitaler Feuchtesensor, mit integriertem Temperatursensor,** kleine Hysterese, hohe Langzeitstabilität
Sensorschutz:	**Kunststoff**-Sinterfilter, Ø 16 mm, L = 35 mm, austauschbar (optional **Metall**-Sinterfilter, Ø 16 mm, L = 32 mm)
FEUCHTE	
Messbereich Feuchte:	**Mehrbereichsumschaltung mit** **8 umschaltbaren Messbereichen** (siehe Tabelle) 0...100 % RH (default)
Arbeitsbereich Feuchte:	10...95 % RH, ohne Betauung
Abweichung Feuchte:	typisch **± 2,0** % (20...80 % RH) bei +25 °C, sonst ± 3,0 % Abweichung der sonstigen Ausgaben ergeben sich aus den Abweichungen von Feuchte und Temperatur.
Ausgang 1, Feuchte:	0-10 V (siehe Tabelle) bei U-Variante 4...20 mA (siehe Tabelle) bei I-Variante
TEMPERATUR	
Messbereich Temperatur:	**Mehrbereichsumschaltung mit** **4 umschaltbaren Messbereichen** (siehe Tabelle) 0...+50 °C (default); –20...+80 °C; –35...+75 °C; –35...+35 °C
Arbeitsbereich Temperatur:	–35...+80 °C Sensorik
Abweichung Temperatur:	typisch ± 0,2 K bei +25 °C
Ausgang 2, Temperatur:	0-10 V (siehe Tabelle) bei U-Variante 4...20 mA (siehe Tabelle) bei I-Variante
Umgebungstemperatur:	Lagerung –35...+85 °C; Betrieb –30...+70 °C, nicht kondensierend
elektrischer Anschluss:	4-Draht bei U-Variante 3-Draht bei I-Variante (Transmitter) 0,14 - 1,5 mm², über Schraubklemmen
Gehäuse:	Kunststoff, UV-beständig, Werkstoff Polyamid, 30 % glaskugelverstärkt, mit Schnellverschlussschrauben (Schlitz / Kreuzschlitz-Kombination), Farbe Verkehrsweiß (ähnlich RAL 9016), Deckel für Display ist transparent!
Abmessungen Gehäuse:	72 x 64 x 37,8 mm (Tyr 1 ohne Display) 72 x 64 x 43,3 mm (Tyr 1 mit Display)
Kabelanschluss:	**Kabelverschraubung** aus Kunststoff (M 16 x 1,5 ; mit Zugentlastung, auswechselbar, max. Innendurchmesser 10,4 mm) **oder** **M12-Steckverbinder** nach DIN EN 61076-2-101 (auf Anfrage)
Schutzrohr:	**PLEUROFORM**™, Werkstoff Polyamid (PA6), verdrehsicher, Ø 20 mm, NL = 235 mm (optional 100 mm), v_{max} = 30 m/s (Luft) (optional auf Anfrage **aus Edelstahl V2A** (1.4301), Ø 16 mm)
Prozessanschluss:	mittels Flansch aus Kunststoff (im Lieferumfang enthalten)
Schutzklasse:	III (nach EN 60 730)
Schutzart:	**IP 65** (nach EN 60 529) im eingebauten Zustand, Gehäuse geprüft, TÜV SÜD, Bericht Nr. 713139052 (Tyr 1)
Normen:	CE-Konformität, elektromagnetische Verträglichkeit nach EN 61 326, EMV-Richtlinie 2014 / 30 / EU
Optional:	**Display mit Beleuchtung,** zweizeilig, Ausschnitt ca. 36 x 15 mm (B x H), zur Anzeige der Ist-Temperatur und Ist-Feuchte, sowie der wählbaren Kenngrößen
ZUBEHÖR	siehe letztes Kapitel

SF-K
Kunststoff-Sinterfilter (Standard)



SF-M
Metall-Sinterfilter (optional)



Schutzrohr aus Edelstahl
(optional auf Anfrage)

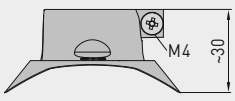


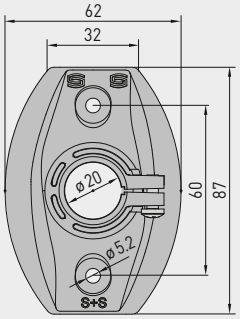
M12-Steckverbinder
(optional auf Anfrage)

MFT-20-K
Montageflansch aus Kunststoff



Maßzeichnung [mm] **MFT-20-K**



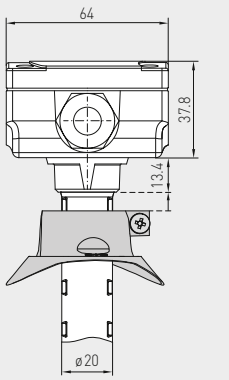


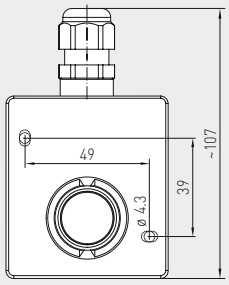
Kanal-Außenfeuchtefühler (± 2,0 %), inkl. Montageflansch, für Mischungsverhältnis, relative / absolute Feuchte, Taupunkt, Enthalpie (umschaltbar) und Temperatur, mit Mehrbereichsumschaltung und aktivem Ausgang

Maßzeichnung
[mm]

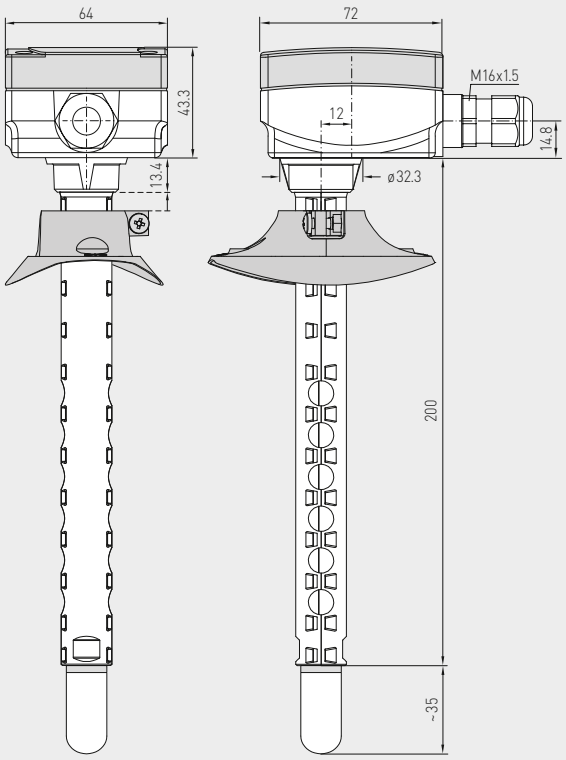
KAVTF

ohne Display





mit Display



KAVTF
mit Kunststoff-Sinterfilter
(Standard)



Temperaturtabelle
MB: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0,0	4,0
-30	0,5	4,7
-25	0,9	5,5
-20	1,4	6,2
-15	1,8	6,9
-10	2,3	7,6
-5	2,7	8,4
0	3,2	9,1
5	3,6	9,8
10	4,1	10,5
15	4,5	11,3
20	5,0	12,0
25	5,5	12,7
30	5,9	13,5
35	6,4	14,2
40	6,8	14,9
45	7,3	15,6
50	7,7	16,4
55	8,2	17,1
60	8,6	17,8
65	9,1	18,5
70	9,5	19,2
75	10,0	20,0

Temperaturtabelle
MB: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0,0	4,0
-30	0,7	5,1
-25	1,4	6,3
-20	2,1	7,4
-15	2,9	8,6
-10	3,6	9,7
-5	4,3	10,9
0	5,0	12,0
5	5,7	13,1
10	6,4	14,3
15	7,1	15,4
20	7,9	16,6
25	8,6	17,7
30	9,3	18,9
35	10,0	20,0

Temperaturtabelle
MB: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0,0	4,0
5	1,0	5,6
10	2,0	7,2
15	3,0	8,8
20	4,0	10,4
25	5,0	12,0
30	6,0	13,6
35	7,0	15,2
40	8,0	16,8
45	9,0	18,4
50	10,0	20,0

Temperaturtabelle
MB: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0,0	4,0
-15	0,5	4,8
-10	1,0	5,6
-5	1,5	6,4
0	2,0	7,2
5	2,5	8,0
10	3,0	8,8
15	3,5	9,6
20	4,0	10,4
25	4,5	11,2
30	5,0	12,0
35	5,5	12,8
40	6,0	13,6
45	6,5	14,4
50	7,0	15,2
55	7,5	16,0
60	8,0	16,8
65	8,5	17,6
70	9,0	18,4
75	9,5	19,2
80	10,0	20,0

Feuchtetabelle
MB: 0...100 % RH

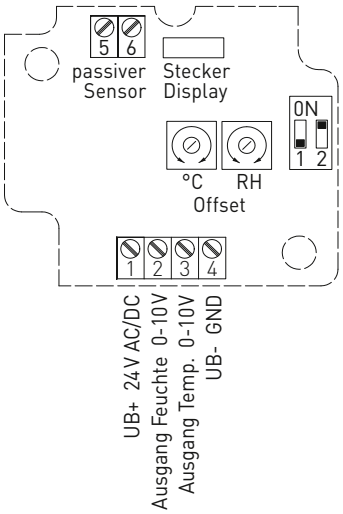
% RH	U_A [V]	I_A [mA]
0	0,0	4,0
5	0,5	4,8
10	1,0	5,6
15	1,5	6,4
20	2,0	7,2
25	2,5	8,0
30	3,0	8,8
35	3,5	9,6
40	4,0	10,4
45	4,5	11,2
50	5,0	12,0
55	5,5	12,8
60	6,0	13,6
65	6,5	14,4
70	7,0	15,2
75	7,5	16,0
80	8,0	16,8
85	8,5	17,6
90	9,0	18,4
95	9,5	19,2
100	10,0	20,0

HYGRASGARD® KAVTF

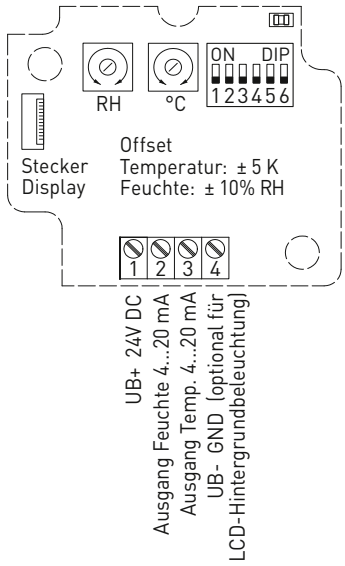
Kanal-Außenfeuchtefühler (± 2,0 %), inkl. Montageflansch, für Mischungsverhältnis, relative / absolute Feuchte, Taupunkt, Enthalpie (umschaltbar) und Temperatur, mit Mehrbereichsumschaltung und aktivem Ausgang

S+S REGELTECHNIK

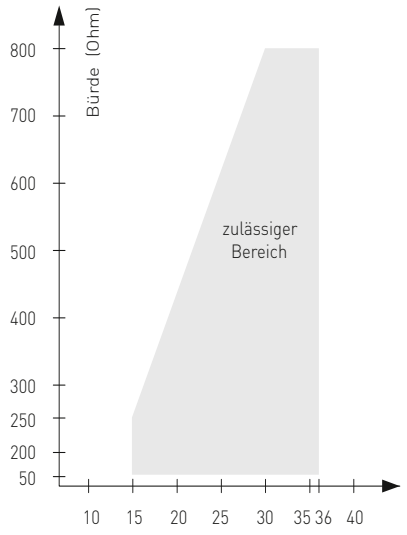
Schaltbild **KAVTF-U** mit Display



Schaltbild **KAVTF-I** mit Display



Bürdendiagramm 4.. 20 mA **KAVTF-I**



Temperatur-Messbereiche (einstellbar)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
–20...+80 °C	**ON**	OFF
–35...+75 °C	OFF	**ON**
–35...+35 °C	**ON**	**ON**

umschaltbare Messbereiche (einstellbar)	DIP 3	DIP 4	DIP 5
RH: **0...100 %** (default)	OFF	OFF	OFF
MV: 0...50 g / kg	**ON**	OFF	OFF
MV: 0...80 g / kg	OFF	**ON**	OFF
a.F.: 0...50 g / m³	OFF	OFF	**ON**
a.F.: 0...80 g / m³	**ON**	**ON**	OFF
TP: 0...+50 °C	**ON**	OFF	**ON**
TP: –20...+80 °C	OFF	**ON**	**ON**
ENT.: 0...85 kJ / kg	**ON**	**ON**	**ON**

mögliche Kenngrößen:

(RH) = relative Feuchte in %
(MV) = Mischungsverhältnis in g / kg
(a.F.) = absolute Feuchte in g / m³
(TP) = Taupunkt in °C
(ENT.) = Enthalpie in kJ / kg

Service Anzeige / Ausgabe (einstellbar)	DIP 6
Anzeige °C und % RH, Ausgabe der eingestellten Messwerte per DIP 1-5 (Service-Modus zur Einstellung °C und % RH)	**ON**
Anzeige und Ausgabe der eingestellten Messwerte per DIP 1-5	OFF

KAVTF
mit Kunststoff-Sinterfilter
SF-K (Standard)



KAVTF
mit Metall-Sinterfilter
SF-M (optional)



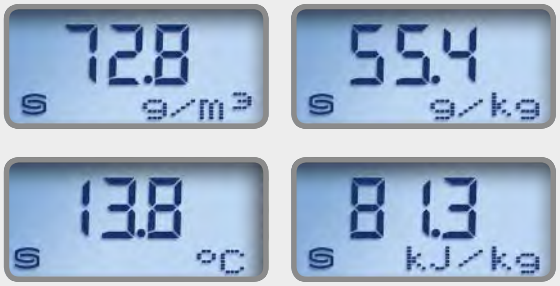
HYGRASGARD® KAVTF

Kanal-Außenfeuchtefühler (± 2,0 %), inkl. Montageflansch, für Mischungsverhältnis, relative / absolute Feuchte, Taupunkt, Enthalpie (umschaltbar) und Temperatur, mit Mehrbereichsumschaltung und aktivem Ausgang

Anzeige Standard **KAVTF Display**



Anzeige alternative Ausgangsgrößen **KAVTF Display**



Anzeige Servicemode **KAVTF Display**



Standardmäßig wird im Display abwechselnd die **Ist-Temperatur** und die **Ist-Feuchte** (relative Feuchte) angezeigt.
Hierbei wird in der erste Zeile der Wert und in der zweiten Zeile die entsprechende Einheit angezeigt:

Temperatur in °C
relative Feuchte in % RH

Zur besseren Ablesbarkeit ist eine Hintergrundbeleuchtung vorhanden.

Über **DIP-Schalter** kann anstelle der Standard-Anzeige die Anzeige einer **alternativen Ausgangsgröße** eingestellt werden:

absolute Feuchte in g / m³
Taupunkt in °C
Mischungsverhältnis in g / kg
Enthalpie in kJ / kg

Im **Servicemode** wird gleichzeitig (abwechselnd in der ersten und zweiten Zeilen) die **Ist-Temperatur** und die **Ist-Feuchte** (relative Feuchte) angezeigt.







KAVTF
mit Display

HYGRASGARD® KAVTF Kanal-Außenfeuchtefühler (± 2,0 %)

Typ / WG01	Messbereich Feuchte		Temperatur		Ausgang Feuchte	Display Temperatur		Art.-Nr.	Preis
KAVTF-I	(umschaltbar)		(umschaltbar)					**I-Variante**	
KAVTF-I	0 ...100 % RH	(default)	0...+50 °C	(default)	4...20 mA	4...20 mA		1201-3162-6000-029	**193,06 €**
	0...50 g / kg	(MV)	–20...+80 °C						
	0...80 g / kg	(MV)	–35...+75 °C						
	0...50 g / m³	(a.F.)	–35...+35 °C						
	0...80 g / m³	(a.F.)							
	0...+50 °C	(TP)							
	–20...+80 °C	(TP)							
	0...85 kJ / kg	(ENT.)							
KAVTF-I **LCD**	(8x wie oben)		(4x wie oben)		4...20 mA	4...20 mA	■	1201-3162-6200-029	**255,36 €**
KAVTF-U								**U-Variante**	
KAVTF-U	(8x wie oben)		(4x wie oben)		0-10 V	0-10 V		1201-3161-6000-029	**193,06 €**
KAVTF-U **LCD**	(8x wie oben)		(4x wie oben)		0-10 V	0-10 V	■	1201-3161-6200-029	**255,36 €**
Aufpreis:	weitere Sonderbereiche optional								**153,95 €**
Optional:	Kabelanschluss mit **M12-Steckverbinder** nach DIN EN 61076-2-101							auf Anfrage	
	verkürztes Schutzrohr **PLEUROFORM**™, NL = 100 mm							auf Anfrage	

ZUBEHÖR

SF-M	**Metall**-Sinterfilter, Ø 16 mm, L = 32 mm, austauschbar, aus Edelstahl **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**

HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative / absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

NEW

S+S REGELTECHNIK

Calibratable screw-in sensor **HYGR**ASGARD® **ESFTF** in a housing made of an impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector as per DIN EN 61076-2-101), duct tube with thread (G1/2") and metal sinter filter (replaceable).

The sensor is used for detecting the relative humidity (0...100 % RH) and the temperature (4 switchable measuring ranges) in **compressed air lines up to max. 10 bar**. The measuring transducer converts the measured values into a standard signal of 4...20 mA or 0 - 10 V. Further parameters are calculated internally from the measured values, that are retrievable via the humidity output: absolute humidity, mixing ratio and dew point temperature (can be changed via DIP switch).

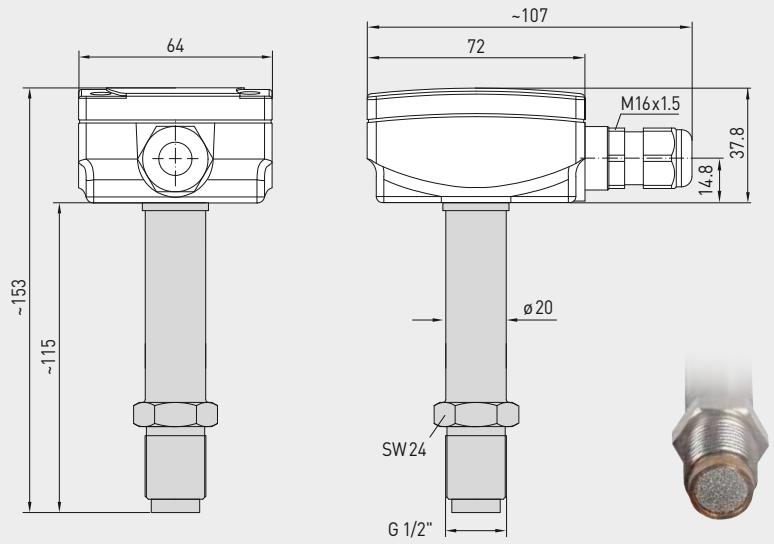
Furthermore, the unit boasts a **sensor protection function for high humidity** (95...99 % RH).
The measuring element is heated automatically in the critical range and thus protected against condensation.
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.
It must be installed vertically with the humidity sensor pointing downwards.

TECHNICAL DATA	
Power supply:	24 V AC/DC (± 10 %) for U variant; 15...36 V DC for I variant, depending on working resistance
Working resistance:	RL_{max} = (UB – 15 V) / 0.02 A for I variant, see working resistance diagram
Power consumption:	< 1.1 VA for U variant; < 1.5 W for I variant
Data points:	relative humidity [% RH], absolute humidity [g/m³], mixing ratio [g/kg], dew point [°C], temperature [°C]
HUMIDITY	
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	metal sinter filter, Ø 20 mm, replaceable, with condensation protection through heating function
Measuring range, humidity:	0...100 % RH (default)
Deviation in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Long-term stability:	± 1 % per year
Output humidity:	0 - 10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Temperature measuring range:	**multi-range switching with** **4 switchable measuring ranges** (see table) 0...+50 °C (default); –20...+80 °C; –30...+70 °C; 0...+100 °C
Deviation in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0 - 10 V for U variant; 4...20 mA for I variant
Response time (t90):	< 60 s
Warm-up time:	< 5 min
Electrical connection:	4-wire for U variant; 3-wire for I variant; 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland** made of plastic (M16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm) **or** **M12 connector** as per DIN EN 61076-2-101 (on request)
Protective tube:	made out of metal, Ø 20 mm, NL = 115 mm, compressive strength p_{max} = 10 bar
Process connection:	thread G1/2", immersion depth 25 mm
Ambient temperature:	storage –20...+50 °C; operation –20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state, sensors IP 30, housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	**sensor protection function for high humidity** (95...99 % RH) If the relative humidity exceeds the factory-set threshold of 95 % RH, a temporally restricted heating function is activated and the sensor is protected against condensation. In this operating state, the output signals remain at the previous measured values prior to activating the heating function.

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative / absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

Dimensional drawing
[mm]

ESFTF



Metal sinter filter
(replaceable)

ESFTF



Temperature table
MR: –30...+70 °C

°C	U_A [V]	I_A [mA]
-30	0.0	4.0
-25	0.5	4.8
-20	1.0	5.6
-15	1.5	6.4
-10	2.0	7.2
-5	2.5	8.0
0	3.0	8.8
5	3.5	9.6
10	4.0	10.4
15	4.5	11.2
20	5.0	12.0
25	5.5	12.8
30	6.0	13.6
35	6.5	14.4
40	7.0	15.2
45	7.5	16.0
50	8.0	16.8
55	8.5	17.6
60	9.0	18.4
65	9.5	19.2
70	10.0	20.0

Temperature table
MR: –20...+80 °C

°C	U_A [V]	I_A [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+100 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

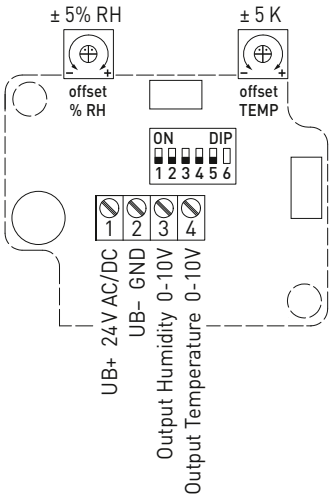
HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative /absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

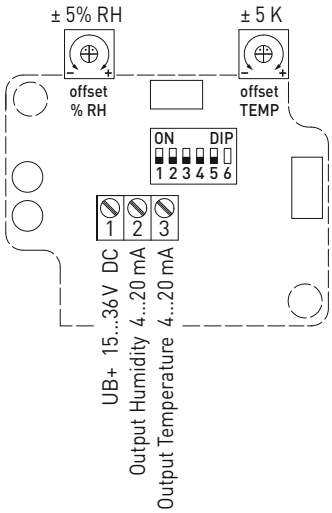
NEW

S+S REGELTECHNIK

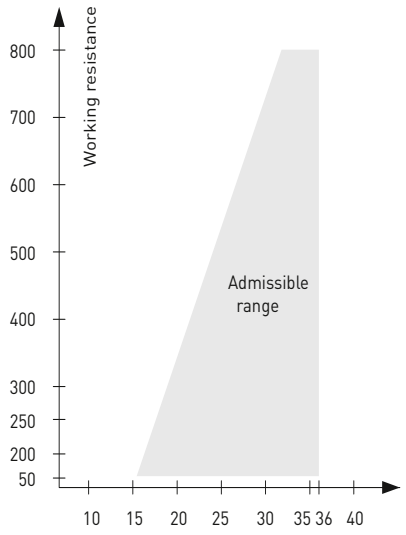
Schematic diagram **ESFTF-U**



Schematic diagram **ESFTF-I**



Load resistance diagram **ESFTF-I**
4.. 20 mA



Connecting diagram **ESFTF-U**

1 UB+ 24 V AC/DC
2 UB– GND
3 Output Humidity 0-10 V
4 Output Temperature 0-10 V

Connecting diagram **ESFTF-I**

1 UB+ 15...36 V DC
2 Output Humidity 4...20 mA
3 Output Temperature 4...20 mA

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
0...+50 °C (default)	OFF	OFF
–20...+80 °C	**ON**	OFF
–30...+70 °C	OFF	**ON**
0...+100 °C	**ON**	**ON**

Switchable measuring ranges (adjustable)		**DIP 3**	**DIP 4**	**DIP 5**
(RH)	**0...100** % (default)	OFF	OFF	OFF
(a.F.)	0...50 g/m³	**ON**	OFF	OFF
(a.F.)	0...80 g/m³	OFF	**ON**	OFF
(MV)	0...50 g/kg	**ON**	**ON**	OFF
(MV)	0...80 g/kg	OFF	OFF	**ON**
(TP)	0...+50 °C	**ON**	OFF	**ON**
(TP)	–20...+50 °C	OFF	**ON**	**ON**
(TP)	–20...+80 °C	**ON**	**ON**	**ON**

(RH) = Relative Humidity [% RH]
(MV) = Mixing Ratio [g/kg]
(a.F.) = Absolute Humidity [g/m³]
(TP) = Dew Point [°C]

Note: **DIP 6** is not assigned!

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative / absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

ESFTF





HYGRASGARD® **ESFTF**	Screw-in humidity and temperature sensor for pressure systems						
Type / WG02	**Measuring range** Humidity	Temperature	**Output** Humidity	Temperature	**Display**	**Item no.**	**Price**
ESFTF-I	**(switchable)**	**(switchable)**				**I variant**	
ESFTF-I	**0…100 % RH** 0…50 g/m³ (a.F.) 0…80 g/m³ (a.F.) 0…50 g/kg (MV) 0…80 g/kg (MV) 0…+50 °C (TP) –20…+50 °C (TP) –20…+80 °C (TP)	**0…+50 °C** –20…+80 °C –30…+70 °C 0…+100 °C	4…20 mA	4…20 mA		1201-2112-1000-000	**544,81 €**
ESFTF-I **LCD**	(as above)	(as above)	4…20 mA	4…20 mA	■	1201-2112-1200-000	**652,41 €**
ESFTF-U	**(switchable)**	**(switchable)**				**U variant**	
ESFTF-U	**0…100 % RH** 0…50 g/m³ (a.F.) 0…80 g/m³ (a.F.) 0…50 g/kg (MV) 0…80 g/kg (MV) 0…+50 °C (TP) –20…+50 °C (TP) –20…+80 °C (TP)	**0…+50 °C** –20…+80 °C –30…+70 °C 0…+100 °C	0-10 V	0-10 V		1201-2111-1000-000	**544,81 €**
ESFTF-U **LCD**	(as above)	(as above)	0-10 V	0-10 V	■	1201-2111-1200-000	**652,41 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

S+S REGELTECHNIK

Pendulum room humidity sensors (± 2.0 %), calibratable, with active output

The calibratable pendulum room humidity sensor **HYGR**ASGARD® **RPFF-SD** with plastic sinter filter measures the relative humidity of air. It converts the measurand humidity into a standard signal of 4...20 mA. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The sensor applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. This sensor is suitable for duct installation, as a pendulum sensor, or for integration in equipment.

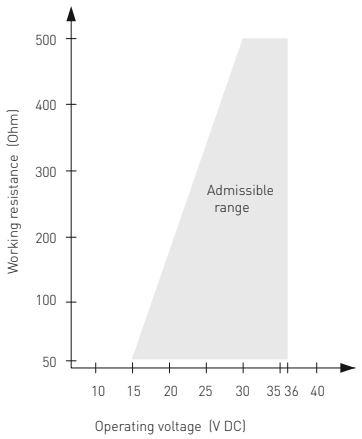
TECHNICAL DATA

Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.03 A R_a < 500 Ohm
Power consumption:	< 1.1 VA / 24 V DC
Sensors:	**digital humidity sensor** small hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH (output corresponding to 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	4...20 mA, see load resistance diagram
Ambient temperature:	storage –25...+50 °C operation –5...+55 °C
Long-term stability:	± 1 % per year
Electrical connection:	2-wire connection (see connecting diagram), 0.14 - 1.5 mm²
Connection cable:	PVC, LiYY, 2 x 0.25 mm², KL = approx. 1.5 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
ACCESSORIES	see last chapter

Humidity table
MR: 0 ...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

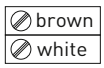
Load resistance diagram **RPFF-SD**
4...20 mA



Circuit board **RPFF-SD**

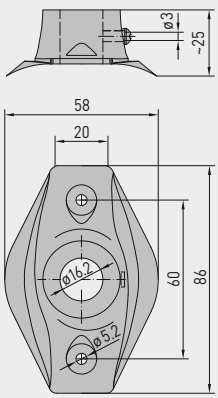


2-wire connection **RPFF-SD-I (Transmitter)**



+UB 24V DC
Output humidity 4-20mA

Dimensional drawing **MF-16-K**

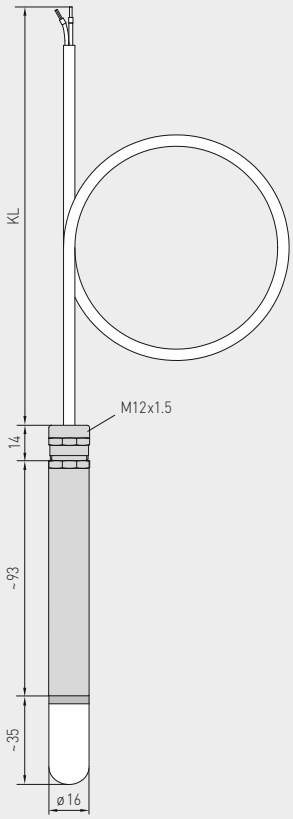


MF-16-K

Mounting flange, plastic (optional)



Dimensional drawing **RPFF-SD**



RPFF-SD

with plastic sinter filter (standard)



SF-M

Metal sinter filter (optional)



HYGRASGARD® RPFF-SD Pendulum room humidity sensors (± 2.0 %), *Standard*				
Type / WG01	**Measuring Range** Humidity (relative)	**Output** Humidity (relative)	**Item No.**	**Price**
RPFF-SD-I			**I- variant**	
RPFF-SD-I	0...100 % RH	4...20 mA	1201-1172-0000-150	**160,80 €**
Extra charge:	**Cable length** (KL) 1.5 m, other lengths optional		on request	
For special orders please specify:	Type, cable length e.g. RPFF-SD-I, 3 m; RPFF-SD-I, 4 m			

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	**9,85 €**
	For further information see last chapter!		

HYGRASGARD® RPFF
HYGRASGARD® RPFTF

Pendulum room humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

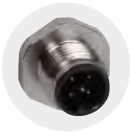
The calibratable pendulum room humidity and temperature sensor **HYGR**ASGARD® **RPFF / RPFTF** with plastic sinter filter measures the relative humidity and temperature of air. It converts the measurands into standard signals of 0 - 10 V or 4...20 mA and is available with or without an optional display. It has four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFF
RPFTF
with plastic sinter filter (standard)



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 -10 V or 4...20 mA)
Operating range, temperature:	–35...+80 °C
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 -10 V or 4...20 mA or Ohm value
Ambient temperature:	storage –5...+60 °C operation –5...+60 °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm² via terminal screws
Connection cable:	PVC, LiYY, 6 x 0.14 mm², KL = approx. 2 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 16 mm, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter



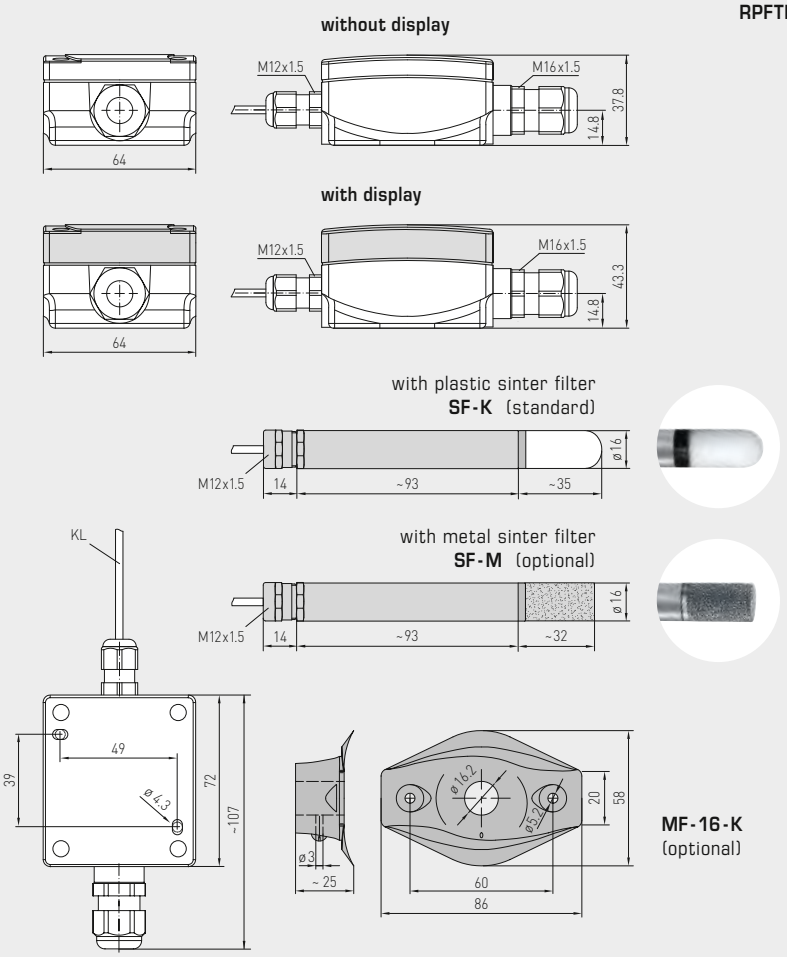
M12 connector
(optional on request)

MF-16-K
Mounting flange, plastic
(optional)



Dimensional drawing

RPFF
RPFTF



RPFF
RPFTF
with display and plastic sinter filter (standard)



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

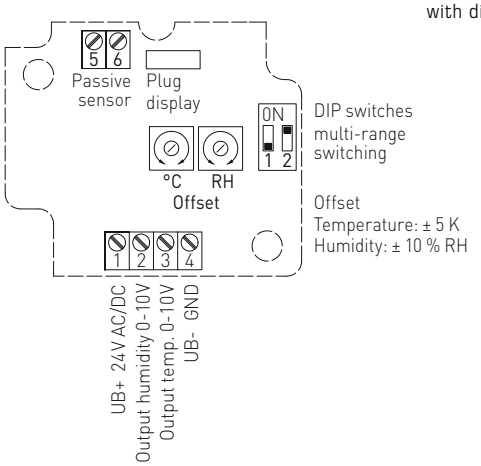
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® RPFF
HYGRASGARD® RPFTF

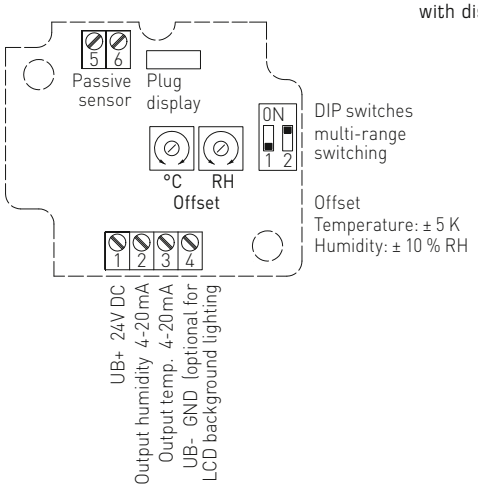
Pendulum room humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **RPFTF-U** with display



Schematic diagram** **RPFTF-I** with display



3-wire connection **RPFF-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection* **RPFF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Free
4	–UB-GND (optional for backlighting)

4-wire connection **RPFTF-U**

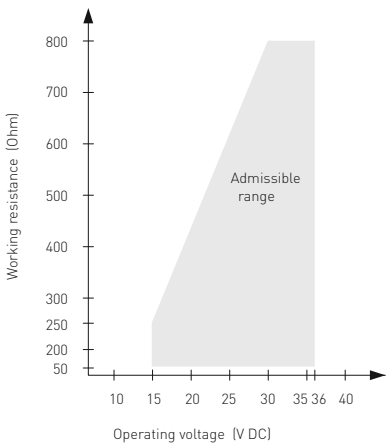
1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND

3- or 4-wire connection** **RPFTF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Output temperature 4-20mA
4	–UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram 4…20 mA **RPFF RPFTF**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

RPFF
RPFTF
with display





HYGRASGARD® **RPFF**	Pendulum room humidity sensors (± 2.0 %), *Premium*
HYGRASGARD® **RPFTF**	Pendulum room humidity and temperature sensors (± 2.0 %), *Premium*

Type / WG01	**Measuring Range / Readout** Humidity	Temperature	**Output** Humidity	Temperature	**Item No.**	**Price**
RPFF						
RPFF-I	0...100 % RH	–	4...20 mA	–	1201-1172-0000-100	**204,55 €**
RPFF-U	0...100 % RH	–	0-10 V	–	1201-1171-0000-100	**204,55 €**
RPFTF						
RPFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-1172-1000-100	**209,13 €**
RPFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-1171-1000-100	**209,13 €**
Extra charge:	Two-line **display with illumination** **Cable length** (KL = 2 m), other lengths optional up to max. 5 m				on request	**51,32 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**
MF-16-K	**Mounting flange,** plastic	7100-0030-0000-000	**9,85 €**
	For further information see last chapter!		

HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable pendulum room humidity and temperature sensor **HYGR**ASGARD® **RPFF-25 / RPFTF-25** with pluggable metal sinter filter, housing made of impact-resistant plastic, with / without optional display.
It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10 V or 4...20 mA. It is equipped with four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

RPFF-25 / RPFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** small hysteresis, high long-term stability, sensor head pluggable
Sensor protection:	**pluggable measuring head** (probe) with **metal** sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation, humidity:	typically **± 1.8** % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with 4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 -10 V or 4...20 mA)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage –35...+85 °C operation –30...+70 °C
Long-term stability:	± 1 % per year
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm² via terminal screws
Connection cable:	KL = 2 m
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø = 18 mm (16 mm), L = 120 mm
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line **display with illumination,** cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter



M12 connector
(optional on request)

MF-16-K
Mounting flange,
plastic
(optional)

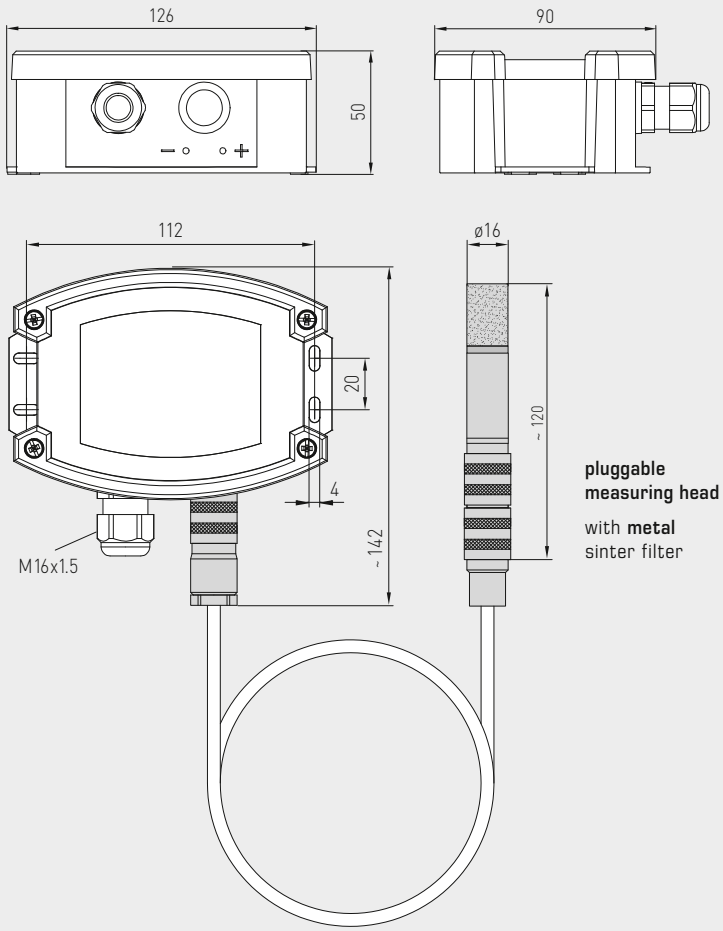


HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

Dimensional drawing

RPFF-25 / RPFTF-25



RPFF-25 / RPFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter and display



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

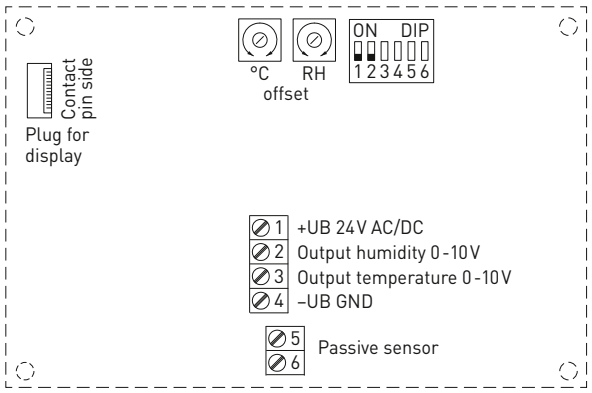
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

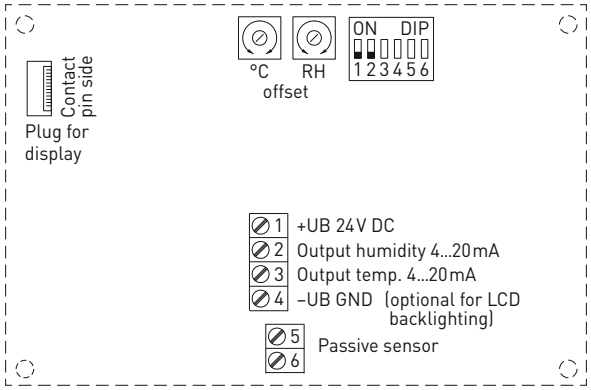
S+S REGELTECHNIK

Schematic diagram — **RPFTF-25-U** with display



DIP 3, 4, 5, 6 are not assigned!

Schematic diagram** — **RPFTF-25-I** with display



DIP 3, 4, 5, 6 are not assigned!

3-wire connection — **RPFF-25-U**

1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Free
4 –UB-GND

2- or 3-wire connection* — **RPFF-25-I (Transmitter)**

1 +UB 24V DC
2 Output humidity 4...20mA
3 Free
4 –UB-GND (optional for backlighting)

4-wire connection — **RPFTF-25-U**

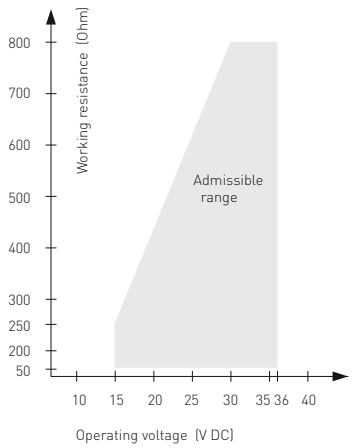
1 +UB 24V AC/DC
2 Output humidity 0-10V
3 Output temperature 0-10V
4 –UB-GND

3- or 4-wire connection** — **RPFTF-25-I (Transmitter)**

1 +UB 24V DC
2 Output humidity 4...20mA
3 Output temp. 4...20mA
4 –UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35...+75 °C	**ON**	**ON**
–35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	**ON**
0...+80 °C	**ON**	OFF

Load resistance diagram 4..20 mA — **RPFF-25** **RPFTF-25**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors (± 1.8 %), calibratable, with multi-range switching and active output

RPFF-25 / RPFTF-25 (± 1.8 %)
with display



HYGRASGARD® RPFF-25	Pendulum room humidity sensors, pluggable (± 1.8 %), *Deluxe*
HYGRASGARD® RPFTF-25	Pendulum room humidity and temperature sensors, pluggable (± 1.8 %), *Deluxe*

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
RPFF-25-I						**I-variant**	
RPFF-25-I	0...100 % RH	–	4... 20 mA	–		1201-7122-0000-100	**426,13 €**
RPFF-25-I **LCD**	0...100 % RH	–	4... 20 mA	–	■	1201-7122-0400-100	**477,45 €**
RPFF-25-U						**U-variant**	
RPFF-25-U	0...100 % RH	–	0-10 V	–		1201-7121-0000-100	**426,13 €**
RPFF-25-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-7121-0400-100	**477,45 €**
RPFTF-25-I						**I-variant**	
RPFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7122-1000-100	**448,43 €**
RPFTF-25-I **LCD**	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7122-1400-100	**499,75 €**
RPFTF-25-U						**U-variant**	
RPFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7121-1000-100	**448,43 €**
RPFTF-25-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7121-1400-100	**499,75 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

ACCESSORIES			
MSK-25	Pluggable **measuring head** (sensor), stainless steel **V2A** (1.4301), **metal** sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable, as replacement element for **RPFF-25 / RPFTF-25**	7201-1131-0000-000	**221,60 €**
MF-16-K	**Mounting flange,** plastic	7100-0030-0000-000	**9,85 €**
	For further information see last chapter!		

HYGRASGARD® VFF
HYGRASGARD® VFTF

Showcase humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable humidity and temperature sensor **HYGR**ASGARD® **VFF / VFTF** measures the relative humidity and temperature of air. It converts the measurands humidity and temperature into a standard signal of 0 - 10 V or 4...20 mA, and is available with / without an optional display.
It is equipped with four switchable temperature ranges. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.
The showcase sensor is used in non-aggressive, dust-free environments and is specifically designed for installation in ceilings, walls, inside showcases or display cabinets in museums, galleries, cinemas or lecture halls or laboratories. The measuring element is contained inside a stainless steel probe and its low height (approx. 2.5 mm) makes it barely noticeable.

VFF
VFTF



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Deviation in humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0 - 10 V for U variant 4...20 mA for I variant, see load resistance diagram
TEMPERATURE	
Measuring range, temperature:	**multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (output corresponding to 0 - 10 V or 4...20 mA)
Deviation, temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	0 - 10 V or 4...20 mA
Ambient temperature:	storage –5...+60 °C; operation –5...+60 °C
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = 2 m
Sensor protection:	**probe** made of stainless steel, **V4A** (1.4571), **pluggable**; sensor head Ø = 17 mm, H = approx. 2.5 mm; protective sleeve Ø = 10 mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector Ø = approx. 11 mm, NL = approx. 25 mm,
Mounting (sensor):	cut-out Ø = 11 - 15 mm, inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line **display with illumination**, cut-out approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity



M12 connector
(optional on request)

VFF
VFTF
Probe made of stainless steel, pluggable

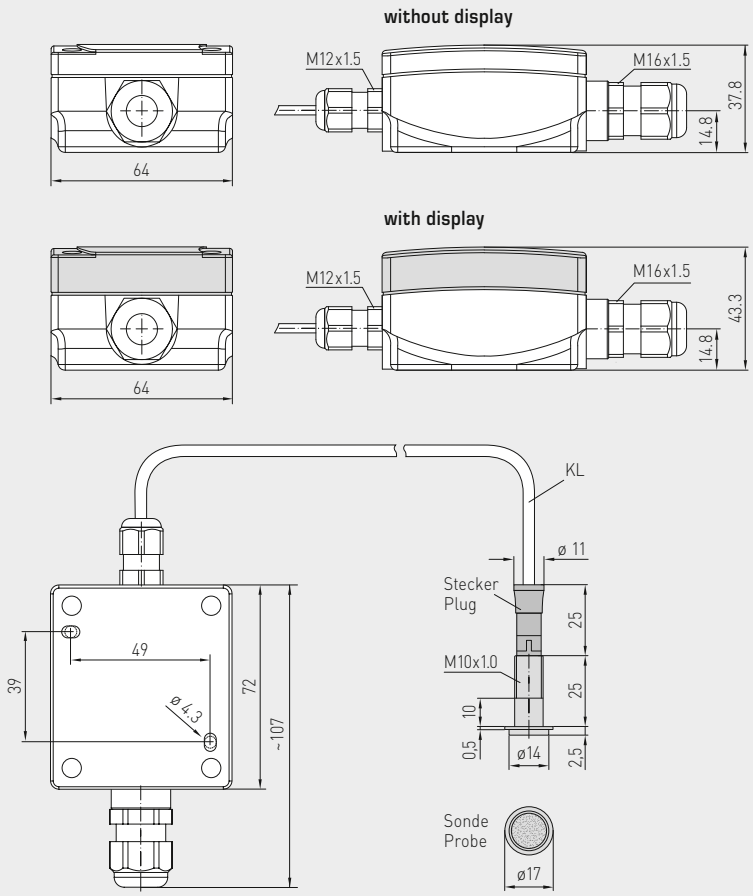


HYGRASGARD® VFF
HYGRASGARD® VFTF

Showcase humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

Dimensional drawing

VFF
VFTF



VFF
VFTF
with display



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

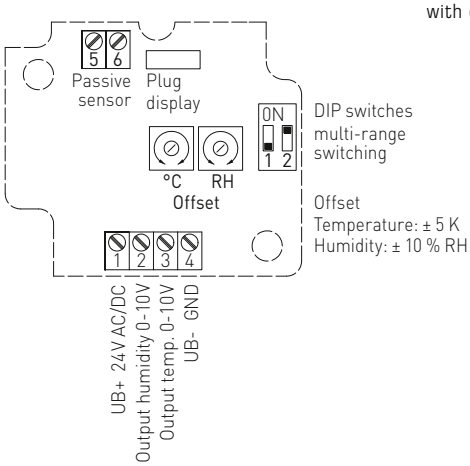
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASGARD® VFF
HYGRASGARD® VFTF

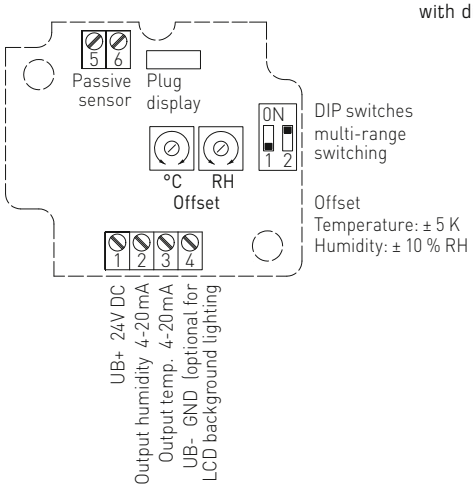
Showcase humidity and temperature sensors (± 2.0 %), calibratable, with multi-range switching and active output

S+S REGELTECHNIK

Schematic diagram **VFTF-U** with display



Schematic diagram** **VFTF-I** with display



3-wire connection **VFF-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	–UB-GND

2- or 3-wire connection* **VFF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Free
4	–UB-GND (optional for backlighting)

4-wire connection **VFTF-U**

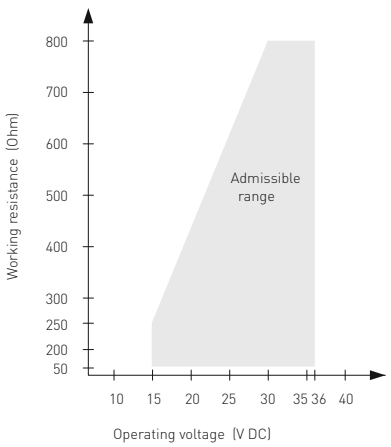
1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	–UB-GND

3- or 4-wire connection** **VFTF-I (Transmitter)**

1	+UB 24V DC
2	Output humidity 4-20mA
3	Output temperature 4-20mA
4	–UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	**DIP 1**	**DIP 2**
–35…+75 °C	**ON**	**ON**
–35…+35 °C	OFF	OFF
0…+50 °C (default)	OFF	**ON**
0…+80 °C	**ON**	OFF

Load resistance diagram 4…20 mA **VFF VFTF**



Connection*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection**:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!

VFF
VFTF
with display



HYGRASGARD® **VFF**	Showcase humiditysensor (± 2.0 %), *Premium*
HYGRASGARD® **VFTF**	Showcase humidity- and temperature sensor (± 2.0 %), *Premium*

Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No.	Price
VFF-I						**I-variant**	
VFF-I	0...100 % RH	–	4...20 mA	–		1201-6122-0000-100	**476,26 €**
VFF-I **LCD**	0...100 % RH	–	4...20 mA	–	■	1201-6122-0200-100	**528,78 €**
VFF-U						**U-variant**	
VFF-U	0...100 % RH	–	0-10 V	–		1201-6121-0000-100	**476,26 €**
VFF-U **LCD**	0...100 % RH	–	0-10 V	–	■	1201-6121-0200-100	**528,78 €**
VFTF-I						**I-variant**	
VFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-6122-1000-100	**480,54 €**
VFTF-I **LCD**	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-6122-1200-100	**533,40 €**
VFTF-U						**U-variant**	
VFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-6121-1000-100	**480,54 €**
VFTF-U **LCD**	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-6121-1200-100	**533,40 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	

HYGRASREG® RHT - 30

Room hygrostats and humidity and temperature sensors (± 2.0 %), electronic, two-step, with continuous / switching outputs

S+S REGELTECHNIK

Electronic room hygrostat and/or room thermostat **HYGR**ASREG® **RHT-30** with one continuous and two switching outputs, adjustable switching thresholds, with / without optional display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class ± 2.0 % RH).
The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The RHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %), 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Setting range:	5...95 % RH (Humidity) +5...+ 45 °C (Temperature) (switch steps 1 and 2 are separately adjustable)
Operating difference:	**Mode 1:** both switch steps are freely adjustable (rel. humidity) **Mode 2:** 5 % between both switch steps (rel. humidity) **Mode 3:** both switch steps freely adjustable (temperature) **Mode 4:** switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1A ohmic load, separately adjustable, 1x 0 - 10 V)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically **± 0.2 K** at +25 °C
Ambient temperature:	storage –35...+85 °C; operation –30...+70 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions:	98 x 98 x 35 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on - wall cable entry from top / bottom in case of plain on - wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature respectively for setpoint adjustment
FUNCTION	
Humidifying/heating:	**1st step:** wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. **2. step:** wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / temperature
Dehumidifying/cooling:	**1st step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. **2. step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S 2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / temperature

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C.
The displays showing the ACTUAL values alternate in a 3-second rhythm.
Resolution: 1/10 % RH or 1/10 °C.

The **2nd line** shows information about the **switching status of the relay** (as a circuit), and indicates the **switching value** in % RH or °C (adjustable via the corresponding set potentiometer). The readouts of the switching thresholds for the first and second relay are displayed alternately at an interval of twenty seconds.

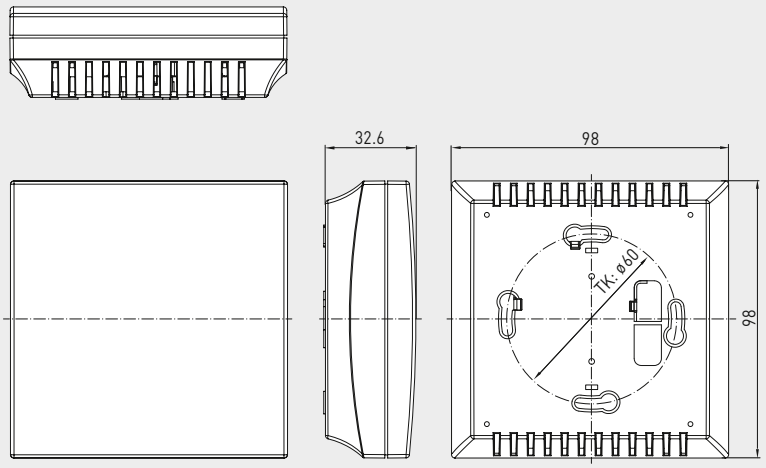
For improved legibility, backlighting is provided.

Display readout **RHT-30**



Dimensional drawing

RHT-30 U

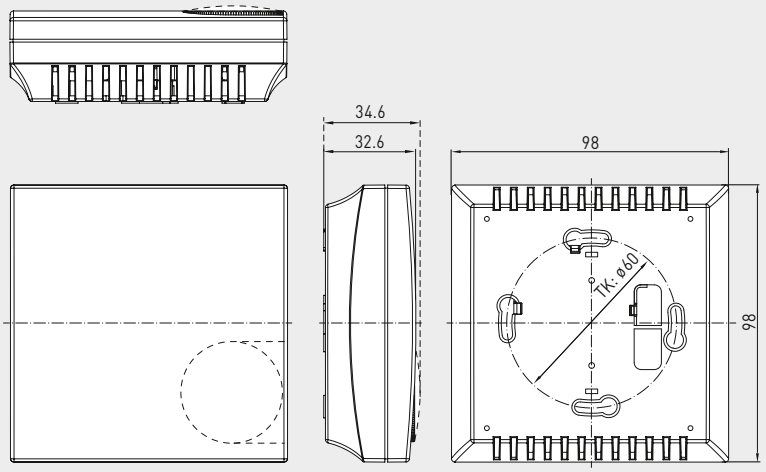


RHT-30 U
with internal setting



Dimensional drawing

RHT-30



RHT-30



RHT-30
with display

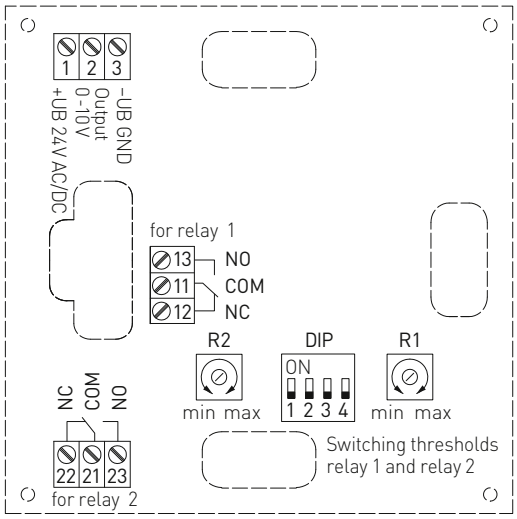


HYGRASREG® RHT-30

Room hygrostats and humidity and temperature sensors (±2.0%), electronic, two-step, with continuous / switching outputs

S+S REGELTECHNIK

Schematic diagram **RHT-30**

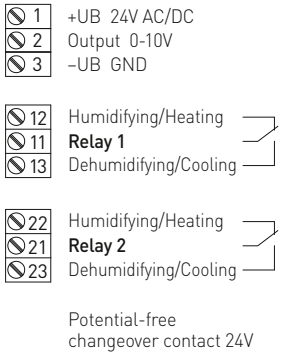


NC = Normally Closed
COM = Common
NO = Normally Open

R1 extended to the outside (adjustment wheel)

DIP switches	RHT-30	
Function mode	**DIP 1**	**DIP 2**
Mode 1 (**2x** 5...95% RH) (default)	OFF	OFF
Mode 2 (5...95% RH **+ 5**% RH)	**ON**	OFF
Mode 3 (**2x** +5...+45 °C)	OFF	**ON**
Mode 4 (5...95% RH / +5...+45 °C)	**ON**	**ON**
Output		**DIP 3**
Temperature		**ON**
Relative humidity (default)		OFF
Backlighting		**DIP 4**
activated		**ON**
deactivated (default)		OFF

Connecting diagram **RHT-30**

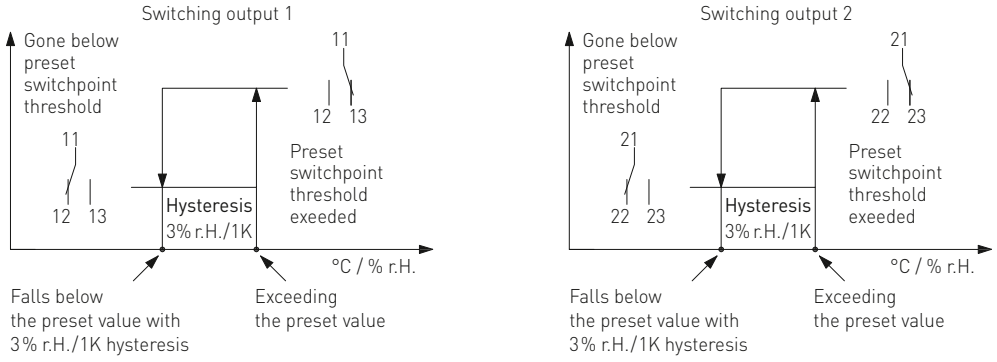


Supply	AC	DC
→ **1**	24 V~	24 V DC
→ **3**	0 V	GND

12	(A1) →	**Relay 1** Breaker contact
11	(W1) →	**Relay 1** Changeover contact
13	(B1) →	**Relay 1** Normally open contact

22	(A2) →	**Relay 2** Breaker contact
21	(W2) →	**Relay 2** Changeover contact
23	(B2) →	**Relay 2** Normally open contact

Switching output **RHT-30**



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95% RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95% RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% RH". Hysteresis of 3% RH is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints for both relay outputs can be defined in the range of +5...+45 °C by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be adjusted in the range of +5...+45 °C or 5...95% RH The thresholds of the setting range (temperature) are 5°C above the minimum or below the maximum range value respectively. The control knob for the temperature can be operated from outside, if necessary.

Humidity table
MR: 0 ...100 % RH

% RH	U_A [V]	% RH	U_A [V]
0	0.0	**50**	5.0
5	0.5	**55**	5.5
10	1.0	**60**	6.0
15	1.5	**65**	6.5
20	2.0	**70**	7.0
25	2.5	**75**	7.5
30	3.0	**80**	8.0
35	3.5	**85**	8.5
40	4.0	**90**	9.0
45	4.5	**95**	9.5
Continued at the right ...		**100**	10.0

Temperature table
MR: 0 ...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

RHT-30
with display



HYGRASREG® RHT-30 Room hygrostats and humidity and temperature sensors (± 2.0 %)

Type / WG02	Setting Range Humidity	Setting Range Temperature	Output	Steps	Display	Item No.	Price
RHT-30						**External setting**	
RHT-30W	5...95 % RH	+5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1011-200	**190,26 €**
RHT-30W **LCD**	5...95 % RH	+5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-4077-1211-200	**203,94 €**
RHT-30-U						**Internal setting**	
RHT-30W U	5...95 % RH	+5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1021-200	**187,51 €**

HYGRASREG® AH - 40

**On-wall hygrostats and humidity sensors (± 2.0 %),
electronic, one-step,
with switching outputs**

S+S REGELTECHNIK

Electronic hygrostat and humidity sensor **HYGR**ASREG® **AH - 40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class ± 2.0 % RH) and for setting the target humidity.

It is suitable for controlling and monitoring the relative air humidity, e.g. in laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The AH - 40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

AH-40
with display and
metal sinter filter
(optional)



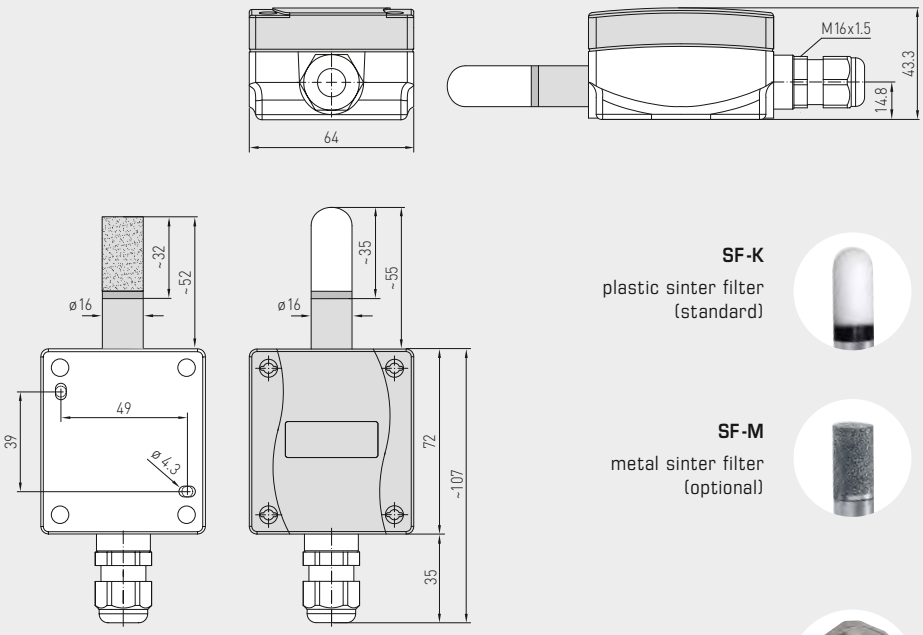
TECHNICAL DATA

Power supply:	24 V AC (± 20 %) 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor,** small hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),, housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm
Prozessanschluss:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC dire ctive 2014 / 30 / EU
Display:	**two-line display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the **relative humidity.** The 2nd line shows on the left side the information regarding the **switching status of the relay** (as a circuit), as well as the **switching value** readout in % RH on the right side (adjustable using the set potentiometer). ○ **Circuit, empty** = relay in idle state ● **Circuit, full** = relay energised
FUNCTION	**actual humidity < switching value** contact 11-12 closed (LED OFF) **actual humidity > switching value** contact 11-13 closed (LED ON)

Display standard **AH-40**



Dimensional drawing **AH-40**



with **metal** sinter filter (optional)

with **plastic** sinter filter (standard)

SF-K
plastic sinter filter (standard)

SF-M
metal sinter filter (optional)

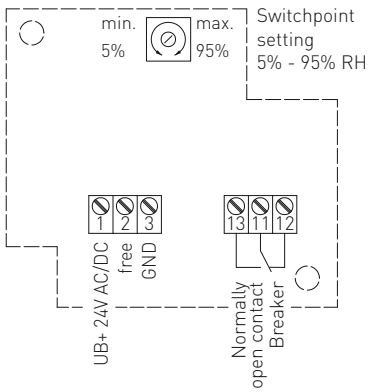
M12 connector (optional on request)



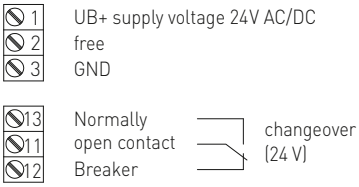
AH-40
with display and plastic sinter filter (standard)



Schematic diagram **AH-40**



Connecting diagram **AH-40**





HYGRASREG® AH-40	On-wall hygrostats and humidity sensors (± 2.0 %), *Premium*					
Type / WG01	**Setting Range** Humidity	**Output**	**Steps**	**Display**	**Item No.**	**Price**
AH-40-U						
AH-40W **LCD**	5...95 % RH	1 x Changeover contact	one-step	■	1202-1065-0221-000	**186,85 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**

HYGRASREG® AHT - 30

On-wall hygrostats and humidity and temperature sensors (± 2.0 %), electronic, two-step, with multi-range switching and continuous / switching output

S+S REGELTECHNIK

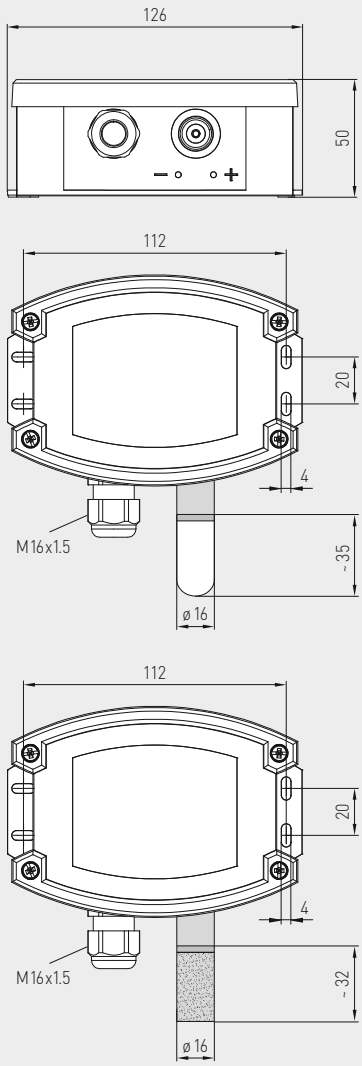
Electronic on-wall hygrostat and/or on-wall thermostat **HYGR**ASREG® **AHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class ± 2.0 % RH). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The AHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 20 %)
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) **Multi-range switching with 4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	**Mode 1:** both switch steps are freely adjustable (rel. humidity) **Mode 2:** 5 % between both switch steps (rel. humidity) **Mode 3:** both switch steps freely adjustable (temperature) **Mode 4:** switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1A ohmic load, separately adjustable, 2x 0 - 10 V for U variant or 4...20 mA for I variant)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.4 K at +25 °C
Ambient temperature:	storage –35...+85 °C; operation – 30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),,housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm (see dimensional drawing)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Display:	three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment
FUNCTION	
Humidifying/heating:	**1st step:** wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. **2nd step:** wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	**1st step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. **2nd step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S 2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature

Dimensional drawing **AHT-30**





SF-K
plastic sinter filter
(standard)



SF-M
metal sinter filter
(optional)

M12 connector
(optional on request)



AHT-30
with display and
plastic sinter filter
(standard)



AHT-30
with display and
metal sinter filter
(optional)



WS-03
Weather and sun protection hood
(optional)



Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C.
The displays showing the ACTUAL values alternate in a 3-second rhythm.
The resolution is 1/10 % RH or 1/10 °C.

The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

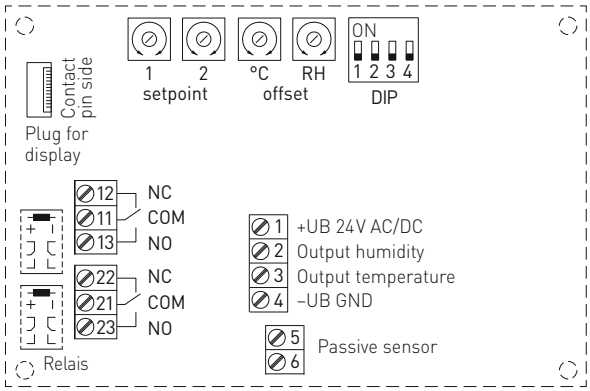
For improved legibility, backlighting is provided.

HYGRASREG® AHT - 30

On-wall hygrostats and humidity and temperature sensors (± 2.0 %), electronic, two-step, with multi-range switching and continuous / switching output

S+S REGELTECHNIK

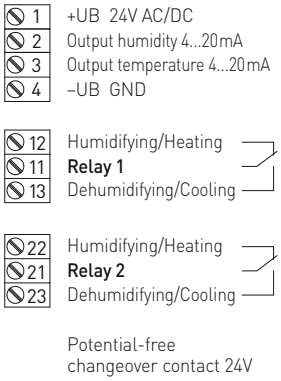
Schematic diagram **AHT-30**



NC = Normally Closed
COM = Common
NO = Normally Open

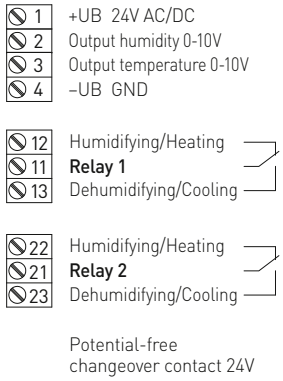
DIP switches	AHT-30	
Function mode	**DIP 1**	**DIP 2**
Mode 1 (**2x** 5...95 % RH) (default)	OFF	OFF
Mode 2 (5...95 % RH **+ 5** % RH)	**ON**	OFF
Mode 3 (**2x** –35...+80 °C)	OFF	**ON**
Mode 4 (5...95 % RH / –35...+80 °C)	**ON**	**ON**
Temperature range	**DIP 3**	**DIP 4**
–35...+35 °C	OFF	OFF
0...+80 °C	**ON**	OFF
0...+50 °C (default)	OFF	**ON**
–35...+75 °C	**ON**	**ON**

Connecting diagram **AHT-30-I**



Potential-free changeover contact 24V

Connecting diagram **AHT-30-U**



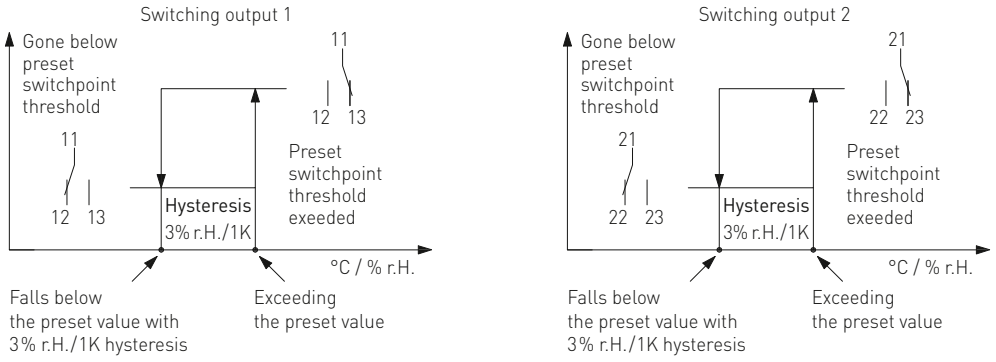
Potential-free changeover contact 24V

Supply	AC	DC
→ **1**	24 V~	24 V DC
→ **4**	0 V	GND

12	(A1) →	**Relay 1** Breaker contact
11	(W1) →	**Relay 1** Changeover contact
13	(B1) →	**Relay 1** Normally open contact

22	(A2) →	**Relay 2** Breaker contact
21	(W2) →	**Relay 2** Changeover contact
23	(B2) →	**Relay 2** Normally open contact

Switching output **AHT-30**



Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95 % RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3 % RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95 % RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5 % RH". Hysteresis of 3 % RH is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95 % RH (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

AHT-30
with display



Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASREG® AHT - 30 On-wall hygrostat and humidity and temperature sensor (± 2.0 %), *Deluxe*

Type / WG02	Setting Range Humidity	Setting Range Temperature	Output	Steps	Display	Item No.	Price
AHT-30-I						**I-variant**	
AHT-30W-I **LCD**	5...95 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-7127-2421-000	**242,89 €**
AHT-30-U						**U-variant**	
AHT-30W-U **LCD**	5...95 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10 V	two-step	■	1202-7127-1421-000	**242,89 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**43,60 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)					7100-0040-6000-000	**46,08 €**

HYGRASREG® KH - 10

Duct hygrostats including mounting flange, mechanical, one-step, with switching output

S+S REGELTECHNIK

Mechanical duct hygrostat **HYGR**ASREG® **KH-10** with switching output as one-step hygrostat. It works without external voltage and is used for controlling and monitoring the relative humidity in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc. to control humidifying and dehumidifying equipment, as minimum guard, or maximum hygrostat. KH-10 is applied in dust-free, pollutant-free, non-aggressive air.

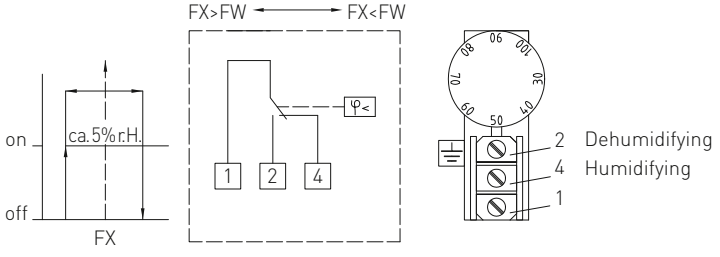
KH-10-U
(with internal setting)



TECHNICAL DATA

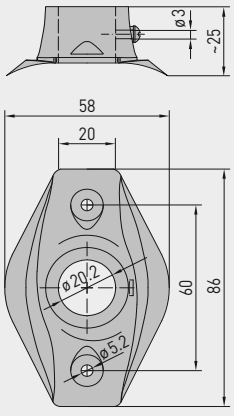
Switching capacity: (Contact load)	15 (2) A; 24...250 V AC, min. 100 mA > 24 V in dry rooms only according to VDE 0110
Setting range:	35...100 % RH
Contact:	dust-proof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Ambient temperature:	0...+ 60 °C
Operating difference:	approx. 3...6 % RH
Measuring accuracy:	typically ± 4 % RH
Controlled medium:	air, unpressurised, non-aggressive
Average temperature coefficient:	0.2 % / K; at +20 °C and 50 % RH
Flow rate:	max. 8 m / s
Sensor sleeve:	made of brass nickel-plated, Ø 20 mm, NL = 223 mm
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	
Humidifying:	Wire contacts 1 - 4. Switch points ON / OFF are approx. 2.5 % RH above or below the selected value.
Dehumidifying:	Wire contacts 1 - 2. Switch points ON / OFF are approx. 2.5 % RH above or below the selected value.

Schematic diagram **KH-10**



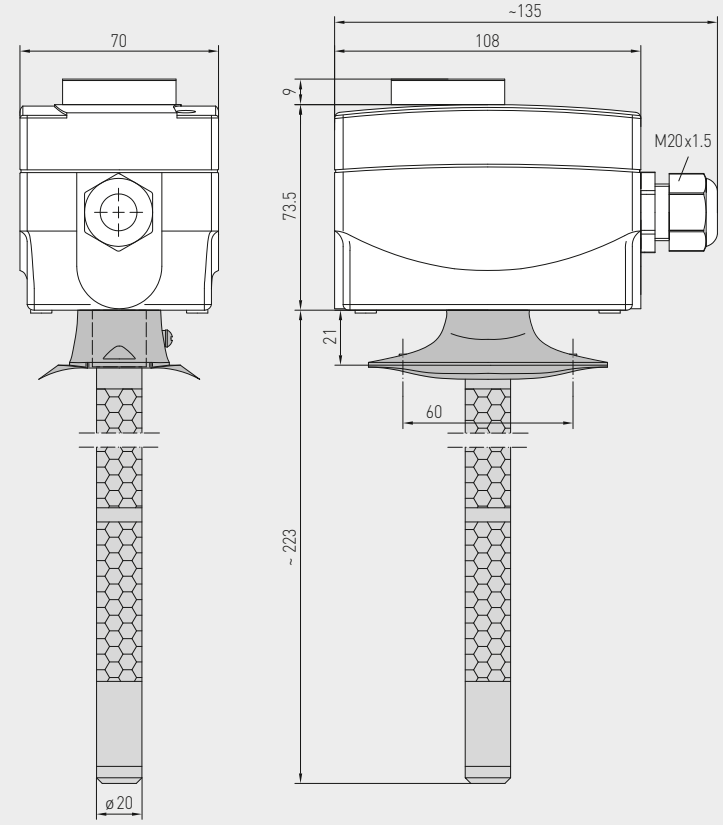
FX = measured relative humidity
FW = Humidity rate preset at the turning knob

Dimensional drawing **MF-20-K**



Dimensional drawing

KH-10



KH-10
(with external setting)



MF-20-K
Mounting flange, plastic



HYGRASREG® KH - 10 Duct hygrostats, mechanical, *Standard*					
Type / WG01	**Setting Range** Humidity	**Steps**	**Features**	**Item No.**	**Price**
KH-10				**External setting**	
KH-10	35...100 % RH	one-step	–	1202-3012-0010-000	**236,24 €**
KH-10-U				**Internal setting**	
KH-10 U	35...100 % RH	one-step	Setpoint setter concealed	1202-3012-0020-000	**233,74 €**

ACCESSORIES			
MF-20-K	**Mounting flange** for KH, plastic, for duct installation (included in the scope of delivery)	7100-0030-4000-000	**9,85 €**
WH-20	**Wall bracket** for KH for on-wall mounting	1200-0010-4000-000	**12,84 €**
	For further information see last chapter!		

HYGRASREG® KH-40

Duct hygrostats and humidity sensors (± 2.0 %), including mounting flange, electronic, one-step, with switching outputs

S+S REGELTECHNIK

Electronic hygrostat and humidity sensor **HYGR**ASREG® **KH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class ± 2.0 % RH) and for setting the target humidity. It is suitable for controlling and monitoring the relative air humidity, e.g. in ventilation and air conditioning ducts, laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The KH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	**digital humidity sensor,** small hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Ambient temperature:	storage –35...+85 °C; operation –30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (on request, optional **stainless steel V2A** (1.4301), Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Display:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the **relative humidity.** The 2nd line shows on the left side the information regarding the **switching status of the relay** (as a circuit), as well as the **switching value** readout in % RH on the right side (adjustable using the set potentiometer). ○ **Circuit, empty** = relay in idle state ● **Circuit, full** = relay energised
FUNCTION	**actual humidity < switching value** contact 11-12 closed (LED OFF) **actual humidity > switching value** contact 11-13 closed (LED ON)

SF-K
Plastic sinter filter (standard)



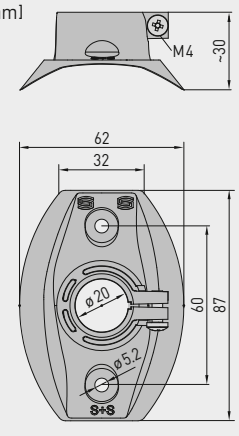
SF-M
Metal sinter filter (optional)



MFT-20-K
Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**

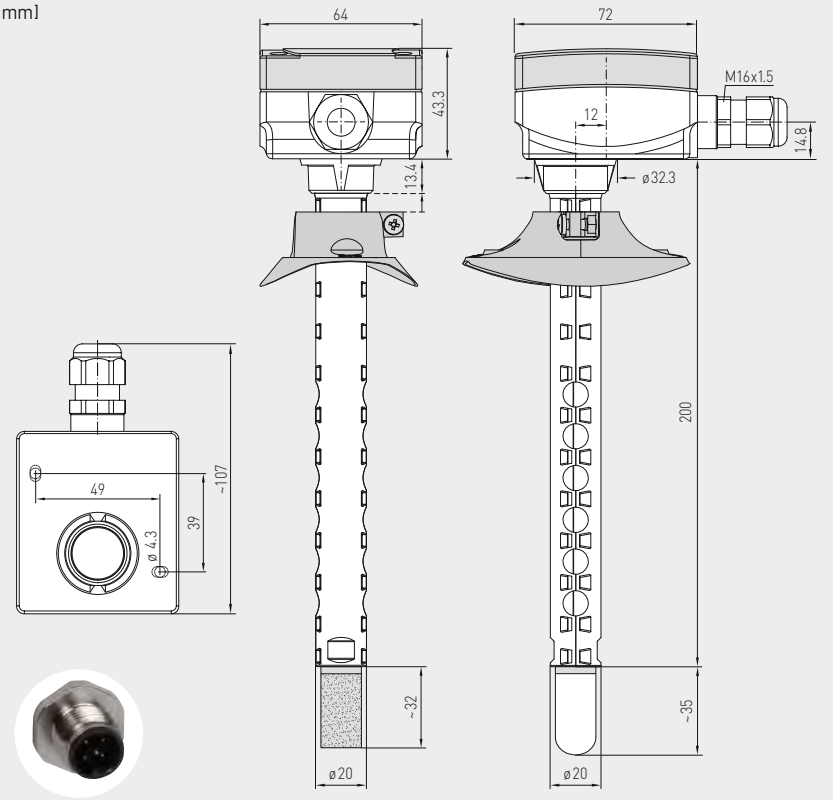


Display standard **KH-40**



Dimensional drawing
[mm]

KH-40



M12 connector
(optional on request)

with **metal**
sinter filter
(optional)

with **plastic**
sinter filter
(standard)

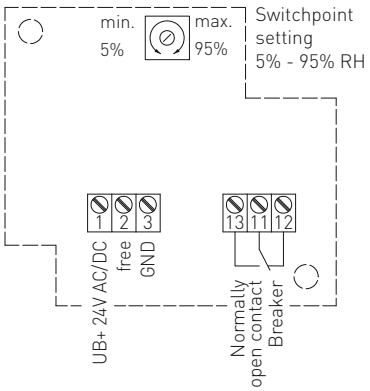
KH-40
with display and
plastic sinter filter
(standard)



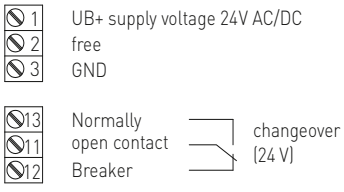




Schematic diagram **KH-40**



Connecting diagram **KH-40**



HYGRASREG® KH-40	Duct hygrostats and humidity sensors (± 2.0 %), *Premium*					
Type / WG01	**Setting Range** Humidity	**Output**	**Steps**	**Display**	**Item No.**	**Price**
KH-40						
KH-40W **LCD**	5...95 % RH	1 x changeover contact	one-step	■	1202-3065-0221-000	**188,09 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**

HYGRASREG® KHT - 30

Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous / switching output

S+S REGELTECHNIK

Electronic duct hygrostat and/or duct thermostat **HYGR**ASREG® **KHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class ± 2.0 % RH). The setpoints can be allocated to the relative humidity and/or to the temperature.

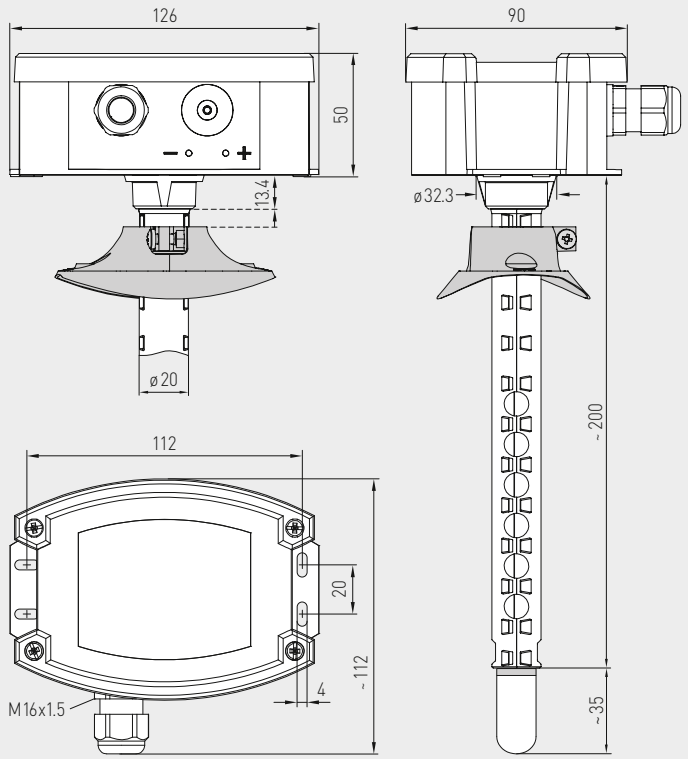
It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The KHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 20 %)
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) **Multi-range switching with** **4 switchable measuring ranges** (see table) –35...+35 °C; –35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	**Mode 1:** both switch steps are freely adjustable (rel. humidity) **Mode 2:** 5 % between both switch steps (rel. humidity) **Mode 3:** both switch steps freely adjustable (temperature) **Mode 4:** switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1A ohmic load, separately adjustable, 2x 0 - 10V for U variant or 4...20mA for I variant)
Deviation, humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically **± 0.2 K** at +25 °C
Ambient temperature:	storage –35...+85 °C; operation – 30...+75 °C, non-precipitating
Long-term stability:	± 1 % per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v_{max} = 30 m/s (air) (optional available on request **stainless steel V2A** (1.4301), Ø 16 mm)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Standards:	CE conformity, EMC directive 2014 / 30 / EU
Display:	three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment
FUNCTION	
Humidifying/heating:	**1st step:** wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. **2nd step:** wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	**1st step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. **2nd step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S 2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature

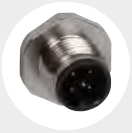
Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output

Dimensional drawing [mm] **KHT-30**



SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



M12 connector
(optional on request)

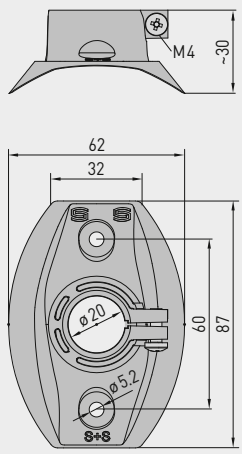
KHT-30
with display and
plastic sinter filter
(standard)



KHT-30
with display and
metal sinter filter
(optional)



Dimensional drawing [mm] **MFT-20-K**



MFT-20-K
Mounting flange,
plastic



Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % RH or 1/10 °C.

The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

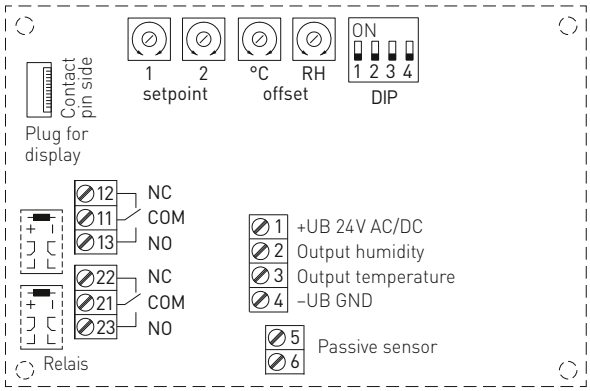
For improved legibility, backlighting is provided.

HYGRASREG® KHT-30

Duct hygrostats and humidity and temperature sensors (± 2.0 %), incl. mounting flange, electronic, two-step, with multi-range switching and continuous/switching output

S+S REGELTECHNIK

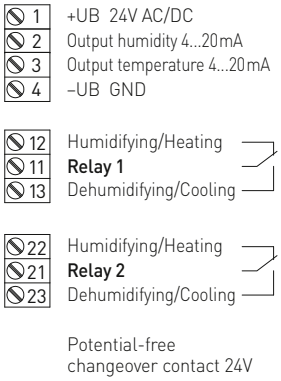
Schematic diagram **KHT-30**



NC = Normally Closed
COM = Common
NO = Normally Open

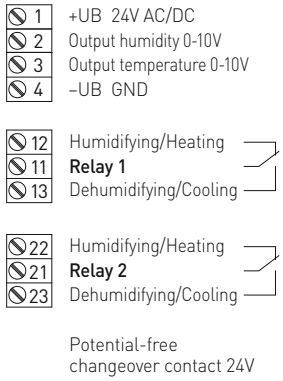
DIP switches	KHT-30	
Function mode	**DIP 1**	**DIP 2**
Mode 1 (**2x** 5...95 % RH) (default)	OFF	OFF
Mode 2 (5...95 % RH **+ 5** % RH)	**ON**	OFF
Mode 3 (**2x** –35...+80 °C)	OFF	**ON**
Mode 4 (5...95 % RH / –35...+80 °C)	**ON**	**ON**
Temperature range	**DIP 3**	**DIP 4**
–35...+35 °C	OFF	OFF
0...+80 °C	**ON**	OFF
0...+50 °C (default)	OFF	**ON**
–35...+75 °C	**ON**	**ON**

Connecting diagram **KHT-30-I**



Potential-free changeover contact 24V

Connecting diagram **KHT-30-U**



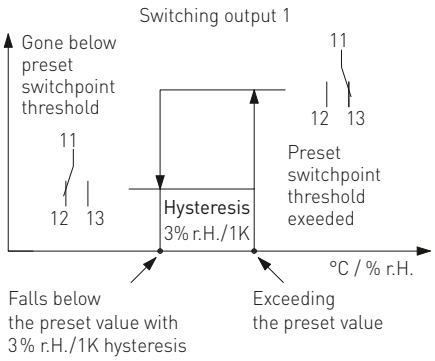
Potential-free changeover contact 24V

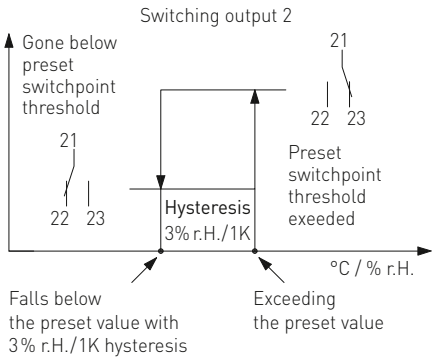
Supply	AC	DC
→ **1**	24 V~	24 V DC
→ **4**	0 V	GND

12	(A1) →	**Relay 1** Breaker contact
11	(W1) →	**Relay 1** Changeover contact
13	(B1) →	**Relay 1** Normally open contact

22	(A2) →	**Relay 2** Breaker contact
21	(W2) →	**Relay 2** Changeover contact
23	(B2) →	**Relay 2** Normally open contact

Switching output **KHT-30**





Mode 1: Independent switchpoints for both relay outputs can be defined in the range of 5...95 % RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3 % RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

Mode 2: In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95 % RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5 % RH". Hysteresis of 3 % RH is also predefined for each switching output in mode 2.

Mode 3: Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

Mode 4: In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95 % RH (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.



KHT-30
with display

Temperature table
MR: –35...+75 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: –35...+35 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

HYGRASREG® KHT-30 Duct hygrostat and humidity and temperature sensor (± 2.0 %), *Deluxe*

Type / WG02	Setting Range Humidity	Setting Range Temperature	Output	Steps	Display	Item No.	Price
KHT-30-I						**I-variant**	
KHT-30W-I **LCD**	5...95 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-8127-2421-000	**242,89 €**
KHT-30-U						**U-variant**	
KHT-30W-U **LCD**	5...95 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10 V	two-step	■	1202-8127-1421-000	**242,89 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request on request	
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)					7000-0050-2200-100	**43,60 €**

HYGRASREG® KW
HYGRASREG® KW-SD

Condensation control switches including strap / with detached sensor head, with switching output

S+S REGELTECHNIK

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The condensation control switch **HYGR**ASREG® **KW** with housing made from impact-resistant plastic with quick-locking screws or the cost-effective **HYGR**ASREG® **KW-SD** with snap-on lid is installed on cooling ceilings, on cooling/cold-water piping or on cooled surfaces and is designed to prevent the formation of condensation.

It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status indicator).

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. The KW condensation control switch can be operated as a monitor on cooling ceilings or pipes so that the switching output is activated when dew builds up on the cooling ceilings of the property to be monitored and e.g. a heating system is started, or other actuators are initiated.

KW-SD
with snap-on lid
(IP 54)



TECHNICAL DATA

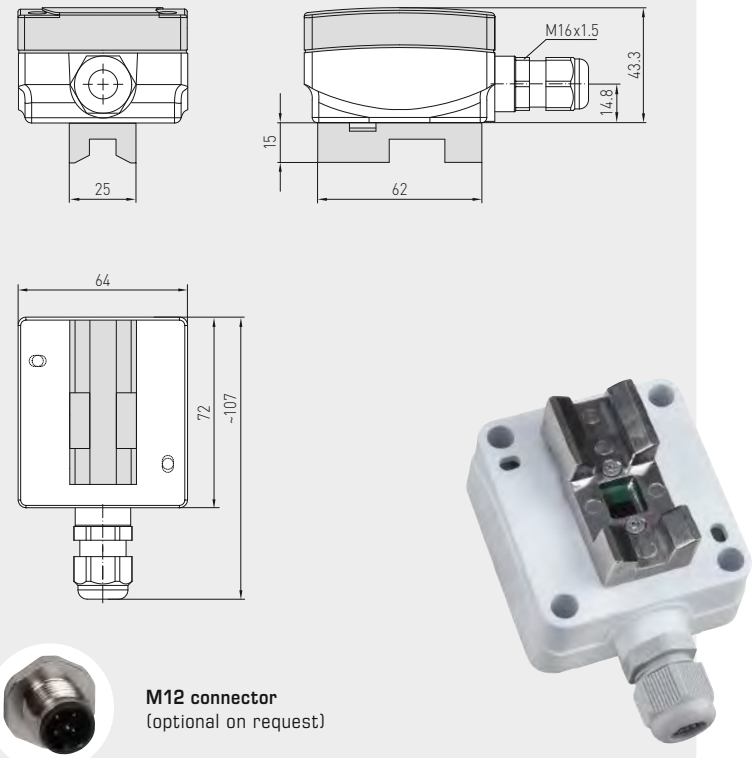
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Switchpoint:	approx. 93 % RH (permanently set)
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover is transparent! **KW-xx** **with quick-locking screws** (slotted / Phillips head combination), **KW-xx-SD** **with snap-on lid,**
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 / Tyr 01)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	**KW / KW-SD** endless strap with metal tightener, 300 mm, for pipes up to 3 " diameter (included in the scope of delivery) **KW / KW-SD -external** cable tie, 200 mm (included in the scope of delivery)
Mounting:	The mounting position should be selected so that no condensate can enter the sensor system in the event that condensation forms! **KW / KW-SD** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **KW-external / KW-SD-external** with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	**KW-xx** **IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **KW-SD-xx** **IP 54** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
FUNCTION	The relay output is triggered (contact 13-11 closed) if the **switchpoint (93 % RH)** is not reached and opens (contact 12-11 closed) in the event of a fault (power failure, condensation).
	**LED short pulses =** relay active → switchpoint not reached ACTUAL humidity **< 93 % RH (no condensation)**
	**LED long pulses =** relay inactive → switchpoint exceeded ACTUAL humidity **> 93 % RH (condensation)**

KW-SD-extern
with snap-on lid
(IP 54)



Dimensional drawing

KW
KW-SD



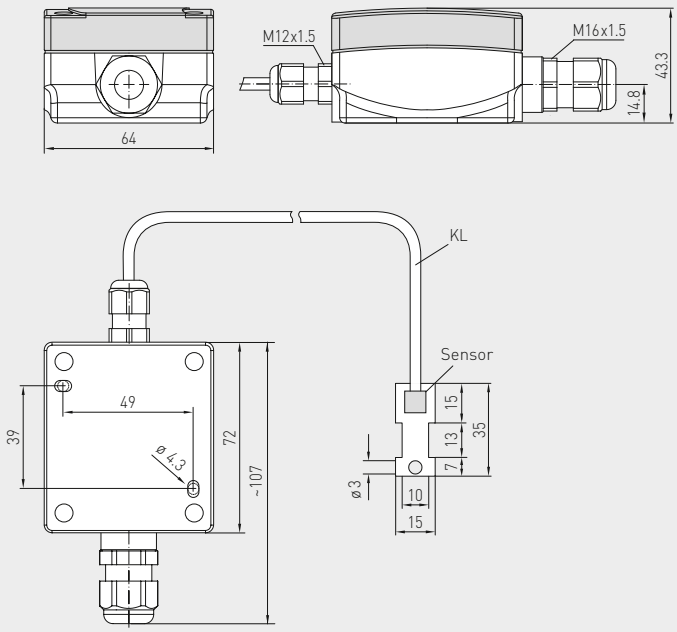
M12 connector
(optional on request)

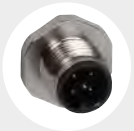
KW
with quick-locking screws
(IP 65)



Dimensional drawing

KW-external
KW-SD-external





M12 connector
(optional on request)

KW-extern
with quick-locking screws
(IP 65)

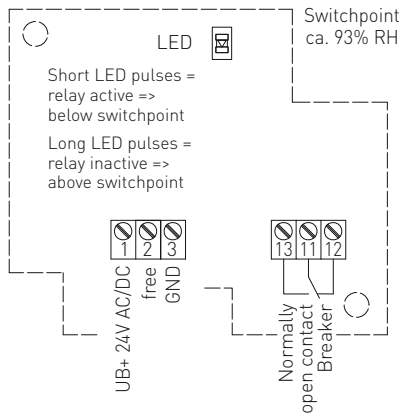


HYGRASREG® KW
HYGRASREG® KW - SD

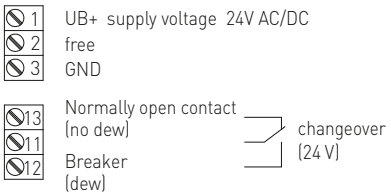
Condensation control switches including strap / with detached sensor head, with switching output

S+S REGELTECHNIK

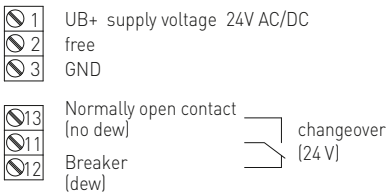
Schematic diagram **KW-W-xx**



Connecting diagram (no condensation) **RH < 93 %** **KW-W-xx**



Connecting diagram (condensation) **RH > 93 %** **KW-W-xx**



KW
pro-dynamic
cross convection



PATENTED



HYGRASREG® KW-SD	Condensation control switches including strap,, *Standard*
HYGRASREG® KW-SD-external	Condensation control switches with detached sensor head, *Standard*

Type / WG01B	**Switchpoint** Humidity	**Output** Humidity	**Mounting**	**Item No.**	**Price**
KW-SD			**Sensor internal**	**IP 54**	
KW-W-SD	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1075-0001-020	**108,78 €**
KW-SD-external			**Sensor external**	**IP 54**	
KW-W-SD extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1075-0001-040	**119,10 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

KW
KW-external
with quick-locking screws
(IP 65)



KW-SD
KW-SD-external
with snap-on lid
(IP 54)



HYGRASREG® KW	Condensation control switches including strap, *Premium*
HYGRASREG® KW-external	Condensation control switches with detached sensor head, *Premium*

Type / WG01	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
KW			**Sensor internal**	**IP 65**	
KW-W	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1025-0001-020	**116,31 €**
KW-external			**Sensor external**	**IP 65**	
KW-W-extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1025-0001-040	**141,26 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101			on request	

Dew point control switches including strap / with detached sensor head, with active / switching outputs

S+S REGELTECHNIK

Patented quality product
(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The dew point control switch **HYGR**ASREG® **TW** is installed on cooling / cold-water piping or on cooled surfaces. It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its patented measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status display), **with / without display**.

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. Facilitated by the continuous measuring range from 0...100 % RH of the **TW-U** and the adjustable switchpoint for the **TW-W** of 75...100 % RH, it is possible to operate cooling ceilings, for example, so that the switching output of the dew point control switch, the DDC, is activated and then triggers a heater or other control elements, thereby preventing the formation of dew on pipes or cooling ceilings or on the property to be monitored.

TW
with quick-locking screws



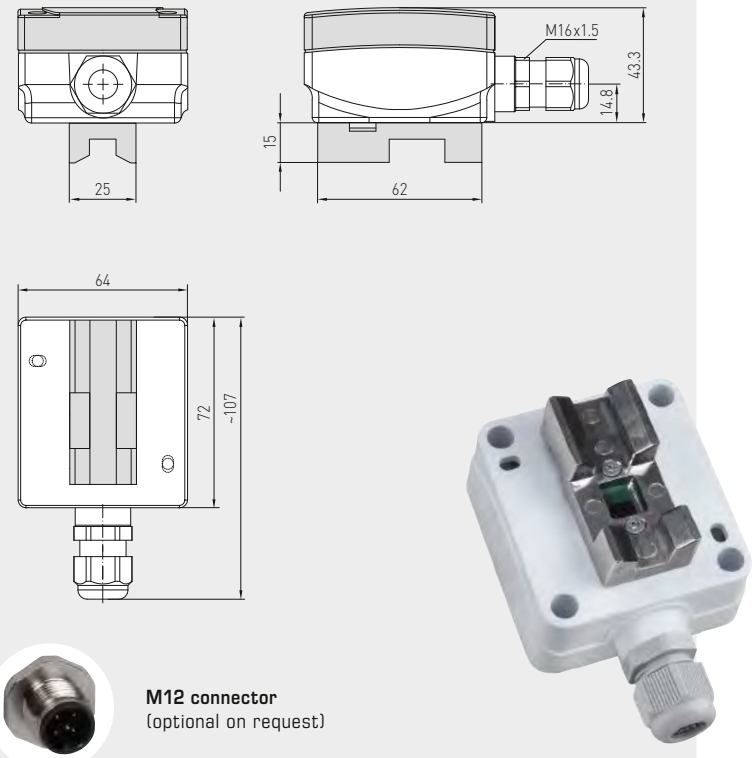
TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring Range:	formation of dew is detected at 0...100 % RH on the **TW-U**, continuous 75...100 % RH on the **TW-W**, switching (switchpoint adjustable by potentiometer, factory setting 75 % RH)
Output:	0-10 V or potential-free changeover contact (24 V), 1 A ohmic load
Sensors:	**digital humidity sensor with integrated temperature sensor,** small hysteresis, high long-term stability
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	**TW** endless strap with metal tightener, 300 mm, for pipes up to 3 " diameter (included in the scope of delivery) **TW-external** cable tie, 200 mm (included in the scope of delivery)
Mounting:	**TW** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **TW-external** with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	two-line **display with illumination,** cutout approx. 36 x 15 mm (W x H), for displaying actual humidity and the switching status of the relay
FUNCTION	The relay output is triggered (contact 13-11 closed) if the **pre-set switchpoint** (factory setting 75 % RH) is not reached and opens (contact 12-11 closed) in the event of an error (power failure, condensation).
	**LED short pulses =** relay active → switchpoint not reached ACTUAL humidity **< pre-set switchpoint (no condensation)**
	**LED long pulses =** relay inactive → switchpoint exceeded ACTUAL humidity **> pre-set switchpoint (condensation)**

TW-extern
with quick-locking screws



Dimensional drawing **TW**

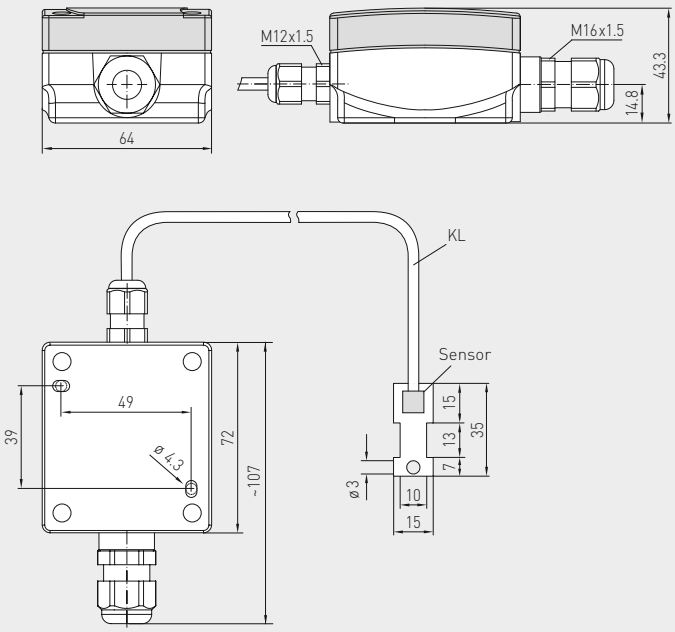


M12 connector
(optional on request)

TW
with display
and quick-locking screws



Dimensional drawing **TW-external**





M12 connector
(optional on request)

TW-extern
with display
and quick-locking screws



Dew point control switches including strap / with detached sensor head, with active / switching outputs

S+S REGELTECHNIK

Display **standard** — **TW-xx Display**



By default, the first line of the display shows the **relative humidity**.

The second line shows the information about the **switching status of the relay** (as a circuit) on the left, and the respective **switching value** in % RH on the right (switchpoint adjustable by potentiometer, factory setting 75 % RH).

○ **Circuit, empty** = relay in idle state
● **Circuit, full** = relay energised

TW
pro-dynamic
cross convection



PATENTED



Connecting diagram (no condensation) **RH < switchpoint** — **TW-UW**

1 UB+ supply voltage 24V AC/DC
2 Output bedewing 0-10V (continuous)
3 GND

13 Normally open contact (no dew)
11 changeover (24 V)
12 Breaker (dew)

Connecting diagram (no condensation) **RH < switchpoint** — **TW-W**

1 UB+ supply voltage 24V AC/DC
2 free
3 GND

13 Normally open contact (no dew)
11 changeover (24 V)
12 Breaker (dew)

Connecting diagram (condensation) **RH > switchpoint** — **TW-UW**

1 UB+ supply voltage 24V AC/DC
2 Output bedewing 0-10V (continuous)
3 GND

13 Normally open contact (no dew)
11 changeover (24 V)
12 Breaker (dew)

Connecting diagram (condensation) **RH > switchpoint** — **TW-W**

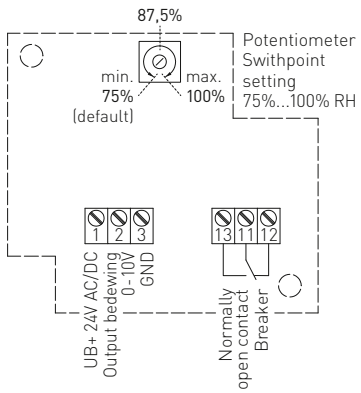
1 UB+ supply voltage 24V AC/DC
2 free
3 GND

13 Normally open contact (no dew)
11 changeover (24 V)
12 Breaker (dew)

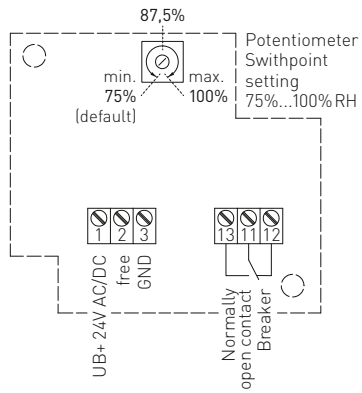
Connecting diagram — **TW-U**

1 UB+ supply voltage 24V AC/DC
2 Output bedewing 0-10V (continuous)
3 GND

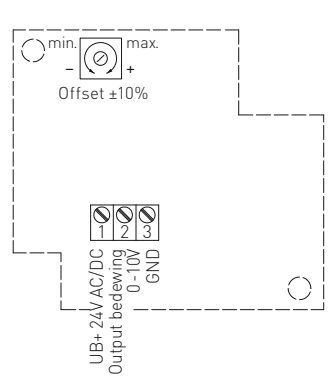
Schematic diagram — **TW-UW**



Schematic diagram — **TW-W**



Schematic diagram — **TW-U**



TW
with display



TW-external
with display



HYGRASREG® TW Dew point control switches including strap (±3%), *Deluxe*
HYGRASREG® TW-external Dew point control switches with detached sensor head (±3%), *Deluxe*

Type / WG01	Measuring Range Humidity	Output Humidity	Mounting	Display	Item No.	Price
TW			**Sensor internal**		**IP 65**	
TW-W	75...100% RH	Changeover contact	for mounting directly on pipes		1202-1015-0001-000	**130,80 €**
TW-W **LCD**	75...100% RH	Changeover contact	for mounting directly on pipes	■	1202-1015-1201-020	**182,11 €**
TW-U	0...100% RH	0-10 V	for mounting directly on pipes		1201-1011-1001-020	**135,77 €**
TW-U/W	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes		1202-1012-1001-020	**155,69 €**
TW-U/W **LCD**	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes	■	1202-1012-1201-020	**207,03 €**
TW-external			**Sensor external**		**IP 65**	
TW-W-extern	75...100% RH	Changeover contact	for mounting on pipes		1202-1015-0021-030	**168,15 €**
TW-W-extern **LCD**	75...100% RH	Changeover contact	for mounting on pipes	■	1202-1015-0221-030	**219,46 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

Leakage sensor / water ingress detector with switching output

S+S REGELTECHNIK

The leakage sensor / water ingress detector **HYGR**ASREG® **LS** with leakage location is used to detect water ingresses and ingresses of conductive liquids. It is designed for the early detection of water leakages to protect sensitive electrical and electronic equipment in buildings against moisture.
The water ingress detector consists of an electronic monitoring system with LED status indicator, and a matching electrode, which can be extended by the user.

LS-2



TECHNICAL DATA

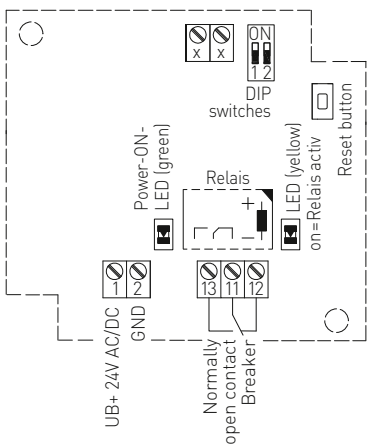
Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Operating range electronics module:	10... 95 % RH; 0...+50 °C
Monitoring range:	conductive liquids between the probes
Switching threshold:	conductance between electrodes > threshold
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	two external probes, laid according to measuring task (on the **LS-2**) or upright on electrodes with insulating plastic caps, which are mounted on the housing underside (on the **LS-4**)
Mounting accessories:	for device type **LS-2** (2 electrodes 10 mm, already permanently mounted) **Electrode extension** 15 mm, 20 mm and 30 mm, 2 pieces each, stainless steel **V2A** (1.4301) (enclosed) **Cable sensor**, L = 1 m (optional)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
FUNCTION	The leak sensor can be set using DIP switches so that the relay is energised during normal operation. This means that relay opens in the event of a fault (water damage, cable breakage, power failure). This also enables a break in the cable to the sensor to be detected.

LS-4



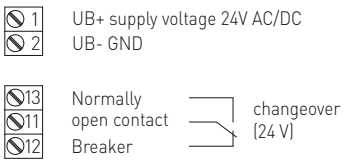


Schematic diagram **LS**



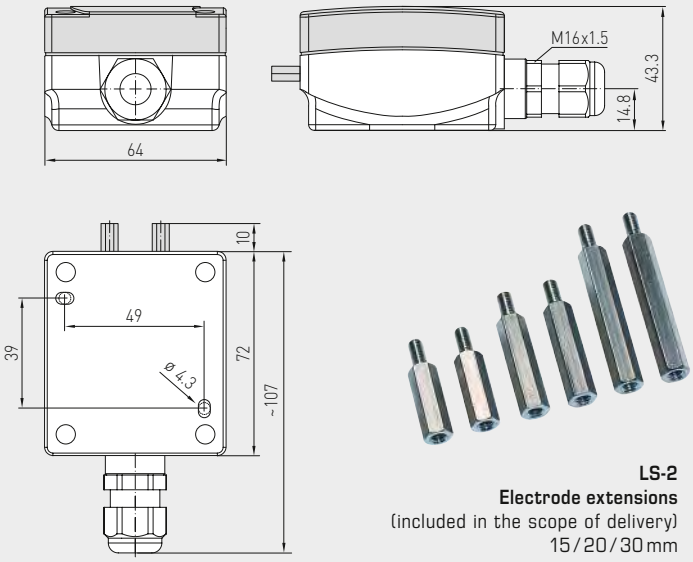
Self-locking (selectable)	**DIP 1**
Self-locking ON	**ON**
Self-locking OFF	OFF
Relay status (selectable)	**DIP 2**
Normally open contact OPEN	**ON**
Normally open contact CLOSED	OFF

Connecting diagram **LS**





Dimensional drawing **LS-2**

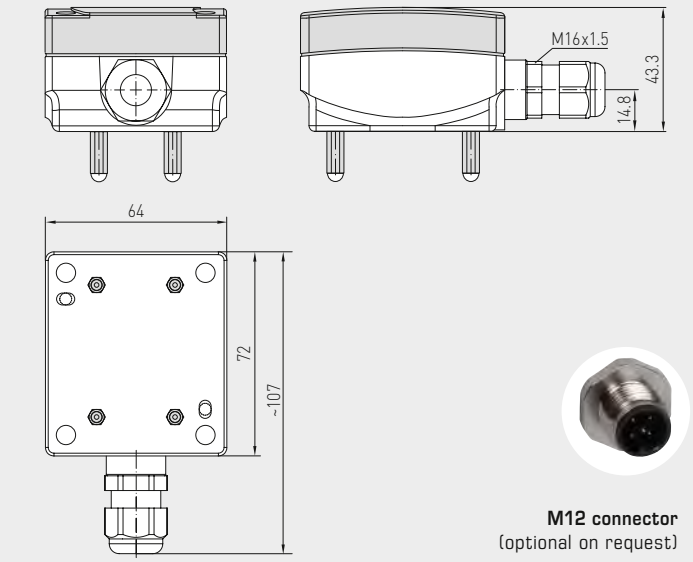


LS-2
Electrode extensions
(included in the scope of delivery)
15 / 20 / 30 mm

LS-2



Dimensional drawing **LS-4**



M12 connector
(optional on request)

LS-4



HYGRASREG® LS	Leakage sensor / water ingress detector			
Type / WG01	**Detection of leakage of conductive liquids**	**Output** Humidity (relative)	**Item No.**	**Price**
LS				
LS-2	Conductance > switching threshold	Changeover contact	1202-1042-0000-000	**107,34 €**
LS-4	Conductance > switching threshold	Changeover contact	1202-1042-0000-100	**121,51 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

ACCESSORIES			
LS-Kabelsonde	**Cable sensor**, L = 1 m, for device type **LS-2**	1202-1042-0000-001	**26,23 €**
	For further information, see last chapter Accessories!		

Pressure

PREMASGARD® & **PREM**ASREG®
Atmospheric quality

Whether absolute or relative, whether positive pressure, differential pressure or negative pressure – we can handle pressure and provide the right solutions with our pressure sensors and pressure controllers. The high precision of the piezo-resistive sensors guarantees reliable performance from 25 Pascal to 300 bar.

Application Areas

- Process and mechanical engineering
- Medical and cleanroom engineering
- Large catering facilities
- Heating, ventilation and air conditioning
- Pump control and pressure lines
- Filter monitoring and air pressure deficiency protection
- Rotational speed and limit value control



476 – 543

S+S REGELTECHNIK







PREMASGARD® & **PREM**ASREG®
PRESSURE SENSORS, PRESSURE CONTROLLERS

for gaseous media [mbar / Pa]

PREMASGARD® **111x**	Pressure measuring transducer	**491**
PREMASGARD® **112x**	Pressure measuring transducer	**491**
PREMASGARD® **112x-SD**	Pressure measuring transducer	**490**
PREMASGARD® **211x**	Pressure measuring transducer	**485**
PREMASGARD® **212x**	Pressure measuring transducer	**485**
PREMASGARD® **212x-SD**	Pressure measuring transducer	**484**
PREMASGARD® **711x**	Pressure measuring transducer	**497**
PREMASGARD® **711x-VA**	Pressure measuring transducer (Stainless steel housing Tyr 2E)	**503**
PREMASGARD® **722x**	Pressure measuring transducer, dual pressure sensor (2 channels)	**509**
PREMASREG® **711x**	Pressure measuring transducer, pressure controller / pressure switch	**515**
PREMASREG® **711x-VA**	Pressure measuring transducer, pressure controller / pressure switch (Stainless steel housing Tyr 2E)	**521**
ALD	Measuring transducer (mbar) atmospheric pressure	**535**
DS 1 / DS 2	Differential pressure switch	**539**

for volume flow [mbar / Pa]

PREMASREG® **716x**	Volume flow measuring transducer, pressure controller / pressure switch	**527**
PREMASREG® **716x-VA**	Volume flow measuring transducer, pressure controller / pressure switch (Stainless steel housing Tyr 2E)	**533**

for liquid media [bar]

SHD	Pressure measuring transducer	**541**
SHD-SD	Pressure measuring transducer	**541**
SHD 692	Pressure measuring transducer	**543**

Special accessories

see chapter Accessories	**649**



Pressure

PREMASGARD® & **PREM**ASREG®

Precise sensor technology for the correct pressure

Broad Spectrum

Our pressure measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications. Take advantage of our experience, our development, manufacturing and product know-how and order these products direct from the manufacturer S+S Regeltechnik. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching, reaction times, units, automatic mode, and manual calibration are selectable via DIP switches.

Optimum Precision

The pressure sensors are developed and manufactured according to the latest criteria. They are fitted with the newest generation sensors that are linearised, temperature-compensated, and offer long-term and zeropoint stability.
The devices are produced at our factory and are calibrated and 100 % tested at our test benches and pressure chambers. Each sensor is precisely re-adjustable using offset potentiometers.
Take advantage of our experience, our development, manufacturing, and product know-how, and order these products directly from the manufacturer.

Tested safety and certified quality

MANAGEMENT SYSTEM CERTIFIED ISO 9001 ISO 14001

RoHS conforming materials

ESD compliant manufacturing

CE conformity

UKCA conformity (UK Conformity Assessed)

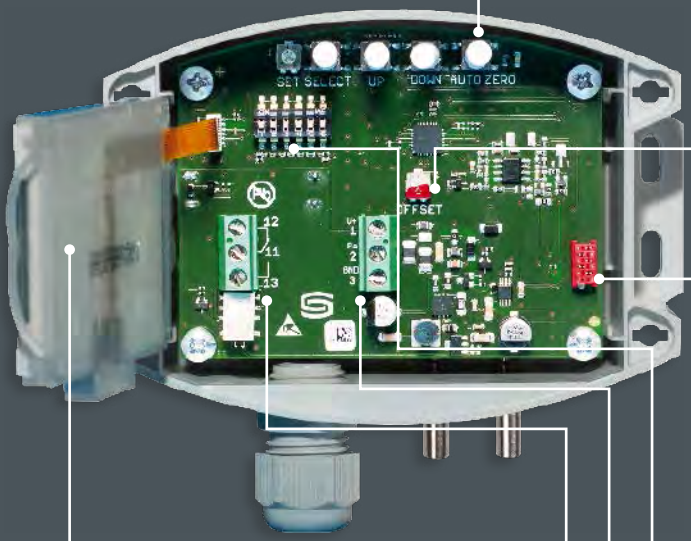
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

EAC certified

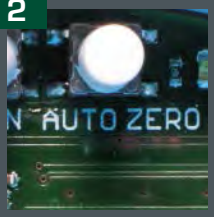
GOST certified

PROUDLY MADE IN GERMANY

S+S REGELTECHNIK



2



Auto-Zero

For zero point correction

3



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

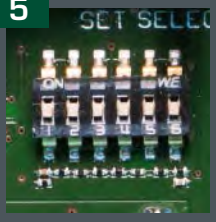
4



Quality Assurance

Calibration and balancing are done by means of the bus system at ther pressure test bench

5



DIP Switches

For multi-range toggling as well as setting of 4 or 8 different measuring ranges, response times, damping times, units and configuration levels

1



Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units

6



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output

7



Relais

With optional automatic zero point calibration and valve for zero point correction







PREMASGARD® 211x/212x/212x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibrateable compact pressure sensors of the **PREM**ASGARD® **211x / 212x / 212x-SD** series are equipped with 8 switchable measuring ranges, 2 switchable output signals (16 devices in one) and with or without optional display and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREM**ASGARD® **111x / 112x / 112x-SD** (I variant with 2-wire connection).

PREMASGARD® **211x**
Pressure connectors **on the top side**, with quick-locking screws (IP 67)



PREMASGARD® **212x**
Pressure connectors **on the bottom side**, with quick-locking screws (IP 67)



PREMASGARD® **212x-SD**
Pressure connectors **on the bottom side**, with snap-on lid (IP 54)



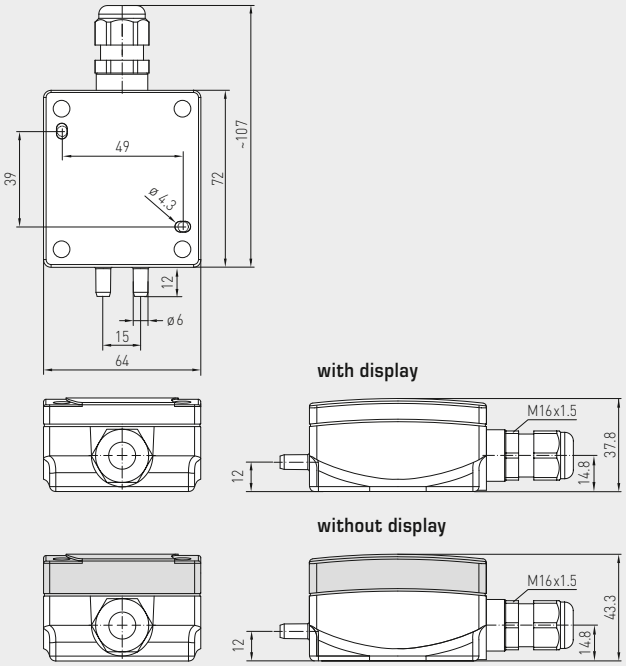
TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	R_a (Ohm) = 25 ...450 Ohm for I variant
Load resistance:	R_L > 25 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring function:	**Differential pressure, volume flow** (square root output signal)
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Output:	**switchable 0-10 V / 4...20 mA** (via DIP switches)
Electrical connection:	3-wire connection
Media temperature:	–20...+50 °C (temperature-compensated 0...+50 °C)
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Accuracy:	**Type 2110 / 2120 / 2120-SD** (100 Pa): typically ± 3 Pa at +25 °C **Type 2111 / 2121 / 2121-SD** (1000 Pa): typically ± 10 Pa at +25 °C **Type 2115 / 2125 / 2125-SD** (5000 Pa): typically ± 35 Pa at +25 °C **Type 2116 / 2126** (10 000 Pa): typically ± 50 Pa at +25 °C compared to the calibrated reference device
Zero point offset:	± 10 % of final value
Above- / below-atmospheric pressure:	± 50 kPa
Long-term stability:	± 1 % per year
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Hysteresis:	0.3 % of final value
Media contacting parts:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Temperature drift values:	± 0.1 % of final value / °C
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! **Type 211x / 212x**: **with quick-locking screws** (slotted/Phillips head combination) **Type 212x-SD**: **with snap-on lid**
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 / Tyr 01 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**Type 211x / 212x**: **IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) **Type 212x-SD**: **IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Features:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	see table

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

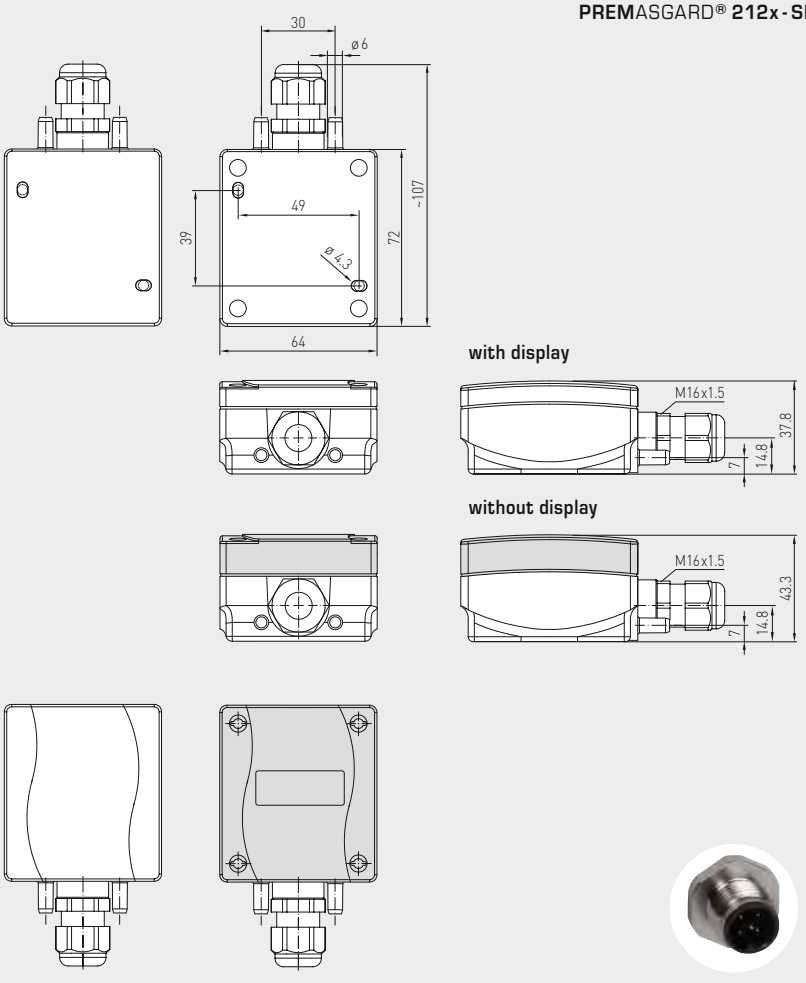
Dimensional drawing

PREMASGARD® 211x



Dimensional drawing

PREMASGARD® 212x
PREMASGARD® 212x-SD



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)

PREMASGARD® 211x
Pressure connectors
on the top side,
with display,
with quick-locking screws
(IP 67)



PREMASGARD® 212x
Pressure connectors
on the bottom side,
with display,
with quick-locking screws
(IP 67)



PREMASGARD® 212x-SD
Pressure connectors
on the bottom side,
with display,
with snap-on lid
(IP 54)



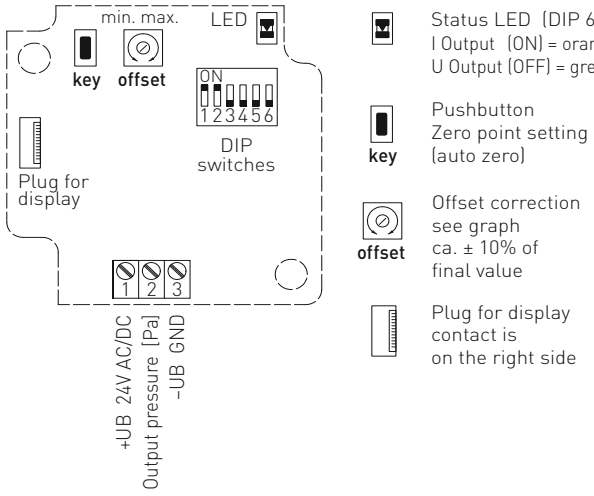
PREMASGARD® 211x/212x/212x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

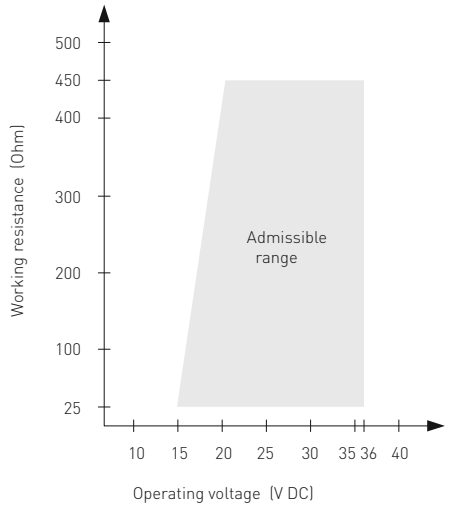
Schematic diagram

PREMASGARD® 211x
PREMASGARD® 212x
PREMASGARD® 212x-SD



Load resistance diagram 4...20 mA

PREMASGARD® 211x
PREMASGARD® 212x
PREMASGARD® 212x-SD



Pressure range max. measuring range (default) is depending to the type of device								**DIP 1**	**DIP 2**
0...50 Pa	0...100 Pa	0...1000 Pa	0...4000 Pa	–50...+50 Pa	–100...+100 Pa	–1000...+1000 Pa	–4000...+4000 Pa	OFF	OFF
–	0...300 Pa	0...2000 Pa	0...6000 Pa	–	–300...+300 Pa	–2000...+2000 Pa	–6000...+6000 Pa	**ON**	OFF
–	0...500 Pa	0...3000 Pa	0...8000 Pa	–	–500...+500 Pa	–3000...+3000 Pa	–8000...+8000 Pa	OFF	**ON**
0...100 Pa	**0...1000 Pa**	**0...5000 Pa**	**0...10000 Pa**	**–100...+100 Pa**	**–1000...+1000 Pa**	**–5000...+5000 Pa**	**–10000...+10000 Pa**	**ON**	**ON**

Measuring range (Mode)	**DIP 3**
Unidirectional (default) (0 ...+MR)	OFF
Bidirectional (–MR ...+MR)	**ON**

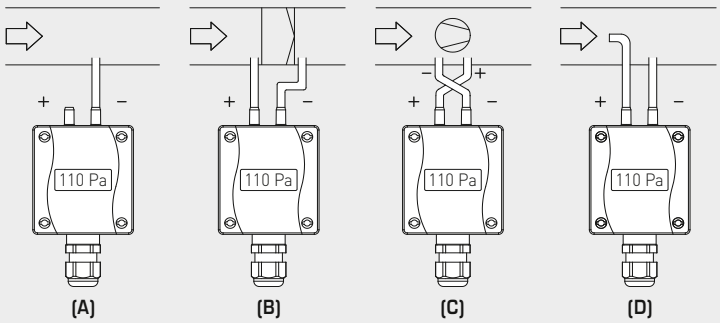
Output characteristic line (Mode)	**DIP 4**
linear (default) for pressure detection	OFF
Square root extracting to determine the volume flow	**ON**

Measurement signal filtering	**DIP 5**
10 s (default) interval	OFF
1 s interval	**ON**

Output (standard signal)	**DIP 6**
Voltage **0-10 V** (default)	OFF
Current **4... 20 mA**	**ON**

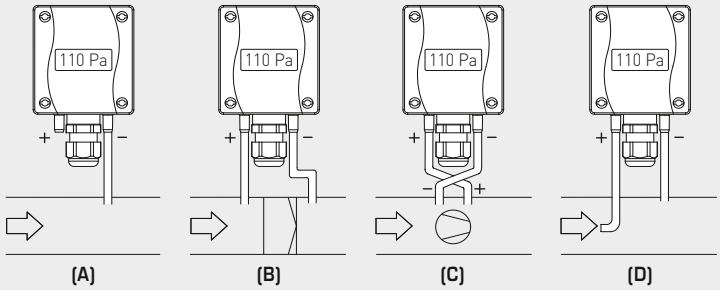
Mounting diagram

PREMASGARD® 211x



Mounting diagram

PREMASGARD® 212x / 212x-SD



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow
k = K factor
Δp = Differential pressure [Pa]

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **211x**
Pressure connectors
on the top side,
with display



PREMASGARD® **212x**
Pressure connectors
on the bottom side,
with display



WS-04
Weather and sun protection hood
(optional)



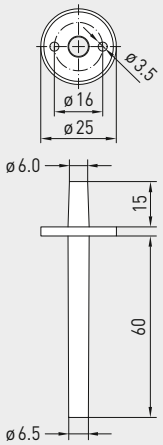
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

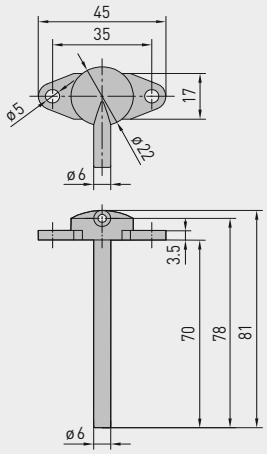
Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

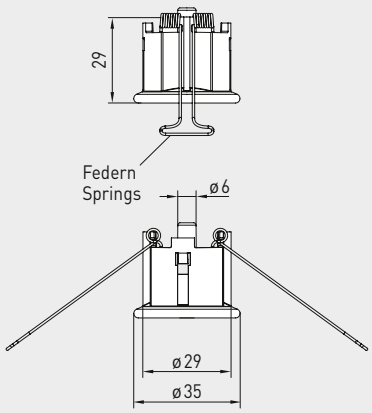
Dimensional drawing **ASD-06**



Dimensional drawing **ASD-07**



Dimensional drawing **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



ACCESSORIES		Item No.	Price
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!		

PREMASGARD® 212x-SD — Pressure, differential pressure and volume flow measuring transducers, *Standard* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	**Type / WG01B** (3-wire connection)	**Output** (switchable)	**Display**	**Item No.** (with snap-on lid)	**Price**
max. – 1000...+ 1000 Pa	**Type 2121-SD**			**IP 54**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0...1000 Pa / –1000...+1000 Pa	PREMASGARD 2121-SD	0-10 V / 4...20 mA		1301-11B7-0010-000	**140,58 €**
	PREMASGARD 2121-SD **LCD**	0-10 V / 4...20 mA	■	1301-11B7-2010-000	**190,62 €**
max. – 5000...+ 5000 Pa	**Type 2125-SD**			**IP 54**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 2125-SD	0-10 V / 4...20 mA		1301-11B7-0050-000	**140,58 €**
	PREMASGARD 2125-SD **LCD**	0-10 V / 4...20 mA	■	1301-11B7-2050-000	**190,62 €**
max. – 100...+ 100 Pa	**Type 2120-SD**			**IP 54**	
0... 50 Pa / – 50...+ 50 Pa 0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 2120-SD	0-10 V / 4...20 mA		1301-11B7-0110-000	**140,58 €**
	PREMASGARD 2120-SD **LCD**	0-10 V / 4...20 mA	■	1301-11B7-2110-000	**190,62 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Output / Connection:	**0-10 V or 4...20 mA** (selectable via DIP switches) / **3-wire** connection				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **211x** (IP 67)



PREMASGARD® **212x** (IP 67)



PREMASGARD® **212x-SD** (IP 54)



PREMASGARD® **211x** — Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the top side)

Pressure range (Ranges adjustable)	Type / WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)	Price
max. – 1000...+ 1000 Pa	**Type 2111**			**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 2111	0-10 V / 4...20 mA		1301-1197-0010-000	**156,67 €**
	PREMASGARD 2111 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2010-000	**208,82 €**
max. – 5000...+ 5000 Pa	**Type 2115**			**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 2115	0-10 V / 4...20 mA		1301-1197-0050-000	**156,67 €**
	PREMASGARD 2115 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2050-000	**208,82 €**
max. – 10000...+ 10000 Pa	**Type 2116**			**IP 67**	
0... 4000 Pa / – 4000...+ 4000 Pa 0... 6000 Pa / – 6000...+ 6000 Pa 0... 8000 Pa / – 8000...+ 8000 Pa 0...10000 Pa / – 10000...+ 10000 Pa	PREMASGARD 2116	0-10 V / 4...20 mA		1301-1197-0060-000	**177,88 €**
	PREMASGARD 2116 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2060-000	**230,03 €**
max. – 100...+ 100 Pa	**Type 2110**			**IP 67**	
0... 50 Pa / – 50...+ 50 Pa 0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 2110	0-10 V / 4...20 mA		1301-1197-0110-000	**156,67 €**
	PREMASGARD 2110 **LCD**	0-10 V / 4...20 mA	■	1301-1197-2110-000	**208,82 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Output / Connection:	**0-10 V or 4...20 mA** (selectable via DIP switches) / **3-wire** connection				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

PREMASGARD® **212x** — Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)	Price
max. – 1000...+ 1000 Pa	**Type 2121**			**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 2121	0-10 V / 4...20 mA		1301-11A7-0010-000	**156,67 €**
	PREMASGARD 2121 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2010-000	**208,82 €**
max. – 5000...+ 5000 Pa	**Type 2125**			**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 2125	0-10 V / 4...20 mA		1301-11A7-0050-000	**156,67 €**
	PREMASGARD 2125 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2050-000	**208,82 €**
max. – 10000...+ 10000 Pa	**Type 2126**			**IP 67**	
0... 4000 Pa / – 4000...+ 4000 Pa 0... 6000 Pa / – 6000...+ 6000 Pa 0... 8000 Pa / – 8000...+ 8000 Pa 0...10000 Pa / – 10000...+ 10000 Pa	PREMASGARD 2126	0-10 V / 4...20 mA		1301-11A7-0060-000	**177,88 €**
	PREMASGARD 2126 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2060-000	**230,03 €**
max. – 100...+ 100 Pa	**Type 2120**			**IP 67**	
0... 50 Pa / – 50...+ 50 Pa 0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 2120	0-10 V / 4...20 mA		1301-11A7-0110-000	**156,67 €**
	PREMASGARD 2120 **LCD**	0-10 V / 4...20 mA	■	1301-11A7-2110-000	**208,82 €**
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Output / Connection:	**0-10 V or 4...20 mA** (selectable via DIP switches) / **3-wire** connection				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

I variant with 2-wire connection

S+S REGELTECHNIK

The calibrateable compact pressure sensors of the **PREM**ASGARD® **111x / 112x / 112x-SD** series are equipped with eight switchable measuring ranges and with or without optional display (eight devices in one) and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREM**ASGARD® **211x / 212x / 212x-SD** (3-conductor connection) with switchable output (0-10 V / 4...20 mA).

TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Measuring function:	**Differential pressure, volume flow** (square root output signal)
Measuring ranges:	**multi-range switching with 8 switchable measuring ranges** (see table)
Output:	0-10 V or 4...20 mA
Electrical connection:	2- or 3-wire connection
Media temperature:	–20...+50 °C
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Accuracy:	**Type 1111 / 1121 / 1121-SD** (1000 Pa): typically ± 10 Pa **Type 1115 / 1125 / 1125-SD** (5000 Pa): typically ± 50 Pa compared to the calibrated reference device
Zero point offset:	± 10 % of final value
Above- / below-atmospheric pressure:	max. 5 x measuring range
Long-term stability:	± 1 % per year
Signal filtering:	**switchable 1 s / 10 s**
Hysteresis:	0.3 % of final value
Media contacting parts:	ms, Ni, Nylon, PU, Si, PVC with plasticisers
Temperature drift values:	± 0.1 % of final value / °C
Current consumption:	< 20 mA
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! **Type 111x / 112x**: **with quick-locking screws** (slotted/Phillips head combination) **Type 112x-SD**: **with snap-on lid**
Housing dimensions:	72 x 64 x 37.8 mm (Typ 1 / Typ 01 without display) 72 x 64 x 43.3 mm (Typ 1 / Typ 01 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**Type 111x / 112x**: **IP 67** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Typ 1) **Type 112x-SD**: **IP 54** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Typ 01) * Housing in the built-in state
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Features:	two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	see table

PREMASGARD® **111x**
Pressure connectors
on the top side
with quick-locking screws
(IP 67)



PREMASGARD® **112x**
Pressure connectors
on the bottom side
with quick-locking screws
(IP 67)

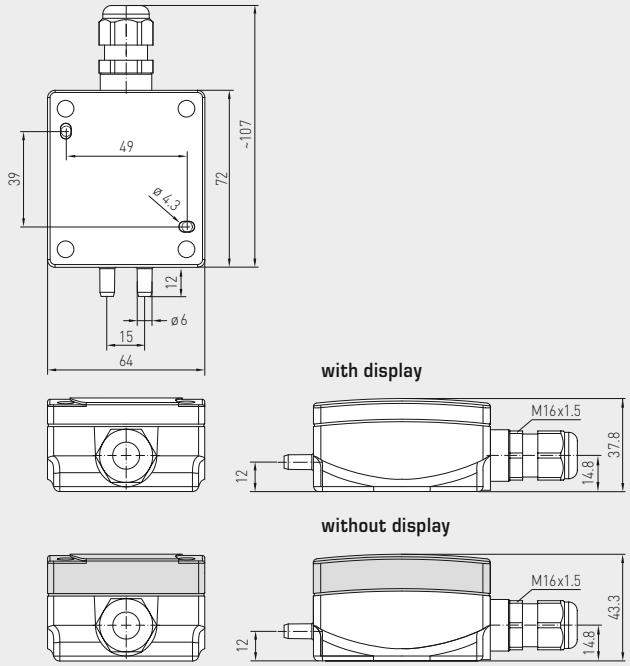


PREMASGARD® **112x-SD**
Pressure connectors
on the bottom side
with snap-on lid
(IP 54)



Dimensional drawing

PREMASGARD® **111x**

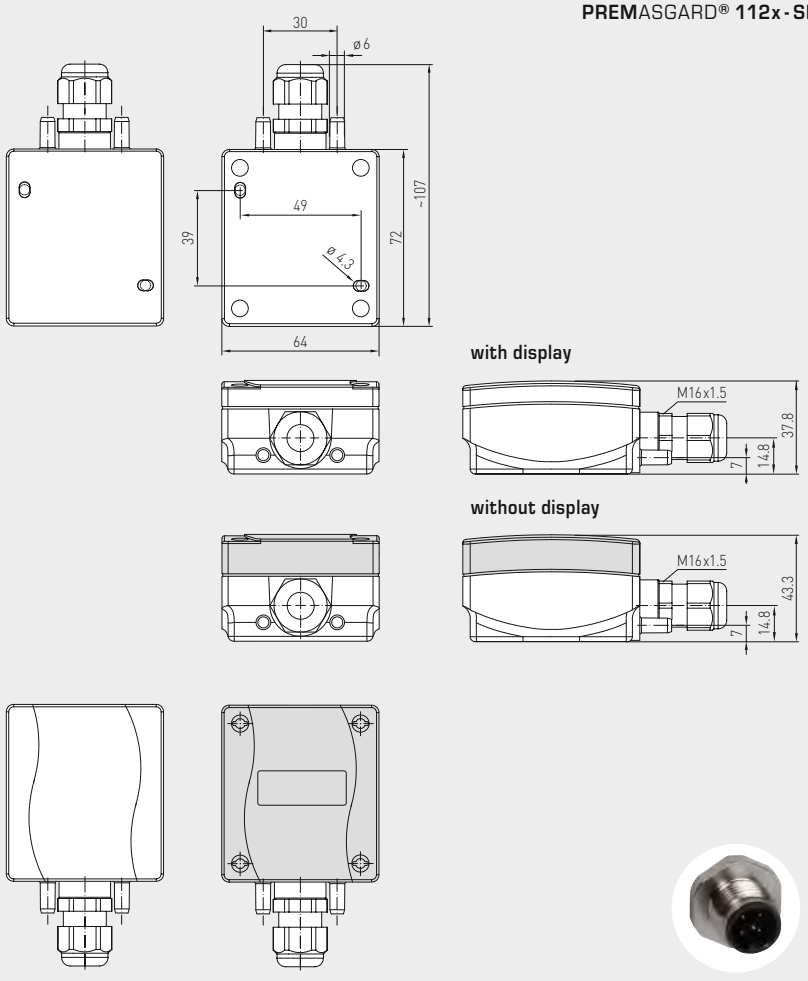


PREMASGARD® **111x**
Pressure connectors
on the top side, with display,
with quick-locking screws
(IP 67)



Dimensional drawing

PREMASGARD® **112x**
PREMASGARD® **112x-SD**



PREMASGARD® **112x**
Pressure connectors
on the bottom side, with display,
with quick-locking screws
(IP 67)



PREMASGARD® **112x-SD**
Pressure connectors
on the bottom side, with display,
with snap-on lid
(IP 54)



PREMASGARD® 111x/112x/112x-SD

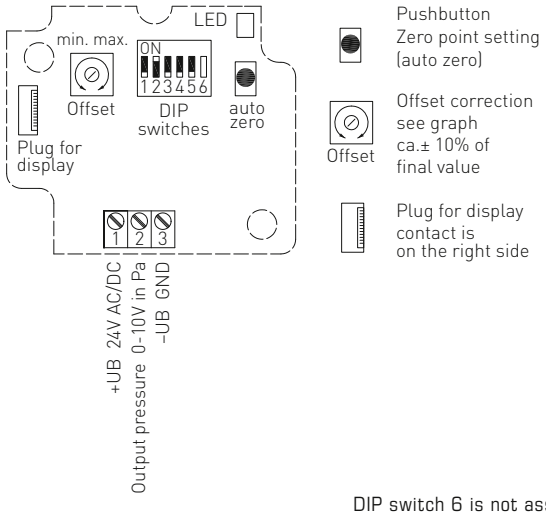
Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

I variant with 2-wire connection

S+S REGELTECHNIK

Schematic diagram
Output:
0-10 V

PREMASGARD® 111x-U
PREMASGARD® 112x-U
PREMASGARD® 112x-SD-U



Pushbutton
Zero point setting
(auto zero)

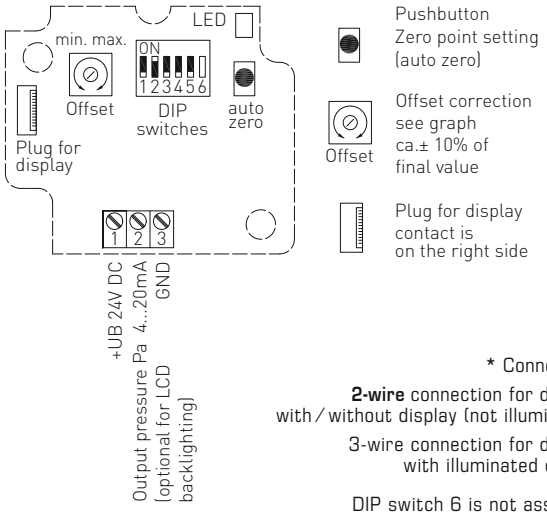
Offset correction
see graph
ca.± 10% of
final value

Plug for display
contact is
on the right side

DIP switch 6 is not assigned!

Schematic diagram *
Output:
4...20 mA

PREMASGARD® 111x-I
PREMASGARD® 112x-I
PREMASGARD® 112x-SD-I



Pushbutton
Zero point setting
(auto zero)

Offset correction
see graph
ca.± 10% of
final value

Plug for display
contact is
on the right side

* Connection:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

DIP switch 6 is not assigned!

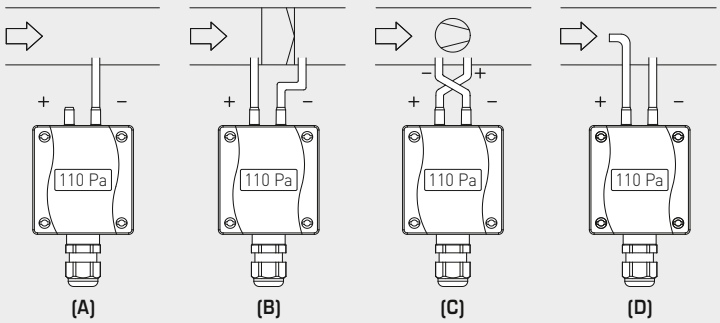
Pressure range max. measuring range (default) is depending to the type of device				**DIP 1**	**DIP 2**
0...100 Pa	0...1000 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
0...500 Pa	0...3000 Pa	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...1000 Pa	**0...5000 Pa**	**–1000...+1000 Pa**	**–5000...+5000 Pa**	**ON**	**ON**

Measuring range (Mode)	**DIP 3**
Unidirectional (default) (0 ...+MR)	OFF
Bidirectional (–MR ...+MR)	**ON**

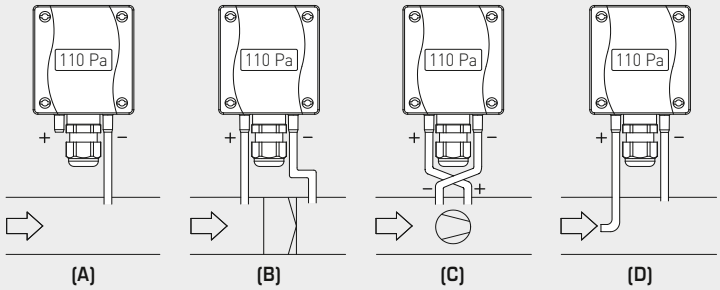
Output characteristic line (Mode)	**DIP 4**
Linear (default) for pressure detection	OFF
Square root extracting to determine the volume flow	**ON**

Measurement signal filtering	**DIP 5**
10 s (default) interval	OFF
1 s interval	**ON**

Mounting diagram — **PREMASGARD® 111x**



Mounting diagram — **PREMASGARD® 112x / 112x-SD**



TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

(A) Below-atmospheric pressure
P1 (+) is not connected, but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow
P1 (+) dynamic pressure, connected in flow direction
P2 (–) static pressure, connected free of dynamic pressure components

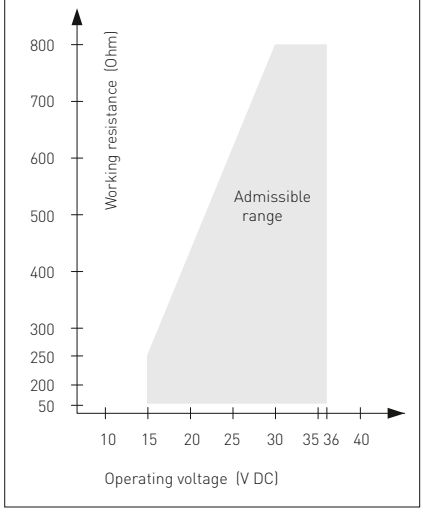
$$\mathbf{V} = k \cdot \sqrt{\Delta p}$$

V = Volume flow
k = K factor
Δp = Differential pressure [Pa]

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

Load resistance diagram 4...20 mA

PREMASGARD® 111x
PREMASGARD® 112x
PREMASGARD® 112x-SD



PREMASGARD® 111x
Pressure connectors **on the top side**, with display



PREMASGARD® 112x
Pressure connectors **on the bottom side**, with display



WS-04
Weather and sun protection hood (optional)



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

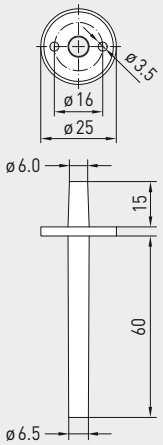
PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

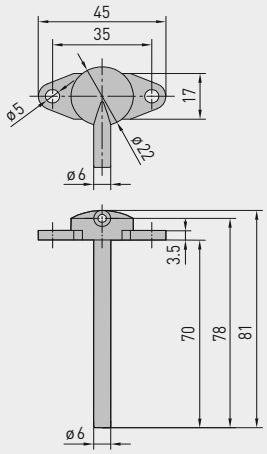
I variant with 2-wire connection

S+S REGELTECHNIK

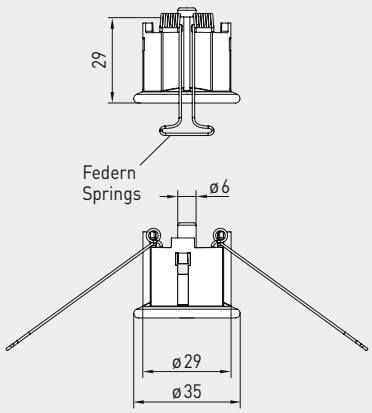
Dimensional drawing **ASD-06**



Dimensional drawing **ASD-07**



Dimensional drawing **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet



ACCESSORIES		Item No.	Price
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!		

PREMASGARD® 112x-SD Pressure, differential pressure and volume flow measuring transducers, *Standard* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with snap-on lid)	Price
max. – 1000...+ 1000 Pa	**Type 1121-SD**				**IP 54**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0...1000 Pa / –1000...+1000 Pa	PREMASGARD 1121-SD-I	**2**	4...20 mA		1301-1182-0010-000	**154,47 €**
	PREMASGARD 1121-SD-I **LCD**	**2**/3	4...20 mA	■	1301-1182-2010-000	**198,97 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x-SD**	
max. – 5000...+ 5000 Pa	**Type 1125-SD**				**IP 54**	
0...1000 Pa / –1000...+1000 Pa 0...2000 Pa / –2000...+2000 Pa 0...3000 Pa / –3000...+3000 Pa 0...5000 Pa / –5000...+5000 Pa	PREMASGARD 1125-SD-I	**2**	4...20 mA		1301-1182-0050-000	**154,47 €**
	PREMASGARD 1125-SD-I **LCD**	**2**/3	4...20 mA	■	1301-1182-2050-000	**198,97 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x-SD**	

Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.
Connection:	**I variant with 2-wire** connection for devices with / without display (not illuminated)
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **111x**
Pressure connectors **on the top side**, with/without display, with quick-locking screws (IP 67)



PREMASGARD® **112x**
Pressure connectors **on the bottom side**, with/without display, with quick-locking screws (IP 67)



PREMASGARD® **112x-SD**
Pressure connectors **on the bottom side**, with/without display, with snap-on lid (IP 54)



PREMASGARD® **111x** — Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the top side)

Pressure range (Ranges adjustable)	**Type / WG01**	**Connection** 2- or 3-wire	**Output**	**Display**	**Item No** (with quick-locking screws)	**Price**
max. – 1000...+ 1000 Pa	**PREM**ASGARD® **1111**				**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 1111-I	**2**	4...20 mA		1301-1112-0010-000	**156,67 €**
	PREMASGARD 1111-I **LCD**	**2**/3	4...20 mA	■	1301-1112-2010-000	**208,82 €**
	–	3	0-10 V		see **PREM**ASGARD® **211x**	
max. – 5000...+ 5000 Pa	**PREM**ASGARD® **1115**				**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 1115-I	**2**	4...20 mA		1301-1112-0050-000	**156,67 €**
	PREMASGARD 1115-I **LCD**	**2**/3	4...20 mA	■	1301-1112-2050-000	**208,82 €**
	–	3	0-10 V		see **PREM**ASGARD® **211x**	
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Connection:	**I variant with 2-wire** connection for devices with / without display (not illuminated)					
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					

PREMASGARD® **112x** — Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	**Type / WG01**	**Connection** 2- or 3-wire	**Output**	**Display**	**Item No** (with quick-locking screws)	**Price**
max. – 1000...+ 1000 Pa	**Type 1121**				**IP 67**	
0... 100 Pa / – 100...+ 100 Pa 0... 300 Pa / – 300...+ 300 Pa 0... 500 Pa / – 500...+ 500 Pa 0... 1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 1121-I	**2**	4...20 mA		1301-1172-0010-000	**156,67 €**
	PREMASGARD 1121-I **LCD**	**2**/3	4...20 mA	■	1301-1172-2010-000	**208,82 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x**	
max. – 5000...+ 5000 Pa	**Type 1125**				**IP 67**	
0...1000 Pa / – 1000...+ 1000 Pa 0...2000 Pa / – 2000...+ 2000 Pa 0...3000 Pa / – 3000...+ 3000 Pa 0...5000 Pa / – 5000...+ 5000 Pa	PREMASGARD 1125-I	**2**	4...20 mA		1301-1172-0050-000	**156,67 €**
	PREMASGARD 1125-I **LCD**	**2**/3	4...20 mA	■	1301-1172-2050-000	**208,82 €**
	–	3	0-10 V		see **PREM**ASGARD® **212x**	
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Connection:	**I variant with 2-wire** connection for devices with / without display (not illuminated)					
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					

PREMASGARD® 711x

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

The calibratable pressure sensors **PREM**ASGARD® **711x** (series) with eight switchable measuring ranges (eight devices in one), housing made from impact-resistant plastic, optionally with/without display, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

PREMASGARD® **711x**
with cable gland



PREMASGARD® **711x-Q**
with M12 connector





Pressure port
for pressure hose
(as standard)



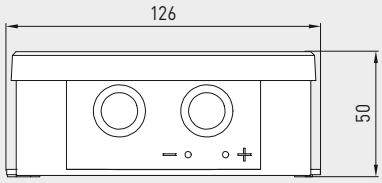
TECHNICAL DATA

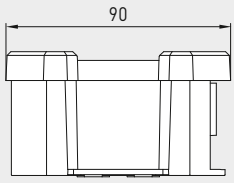
Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 2 VA / 24 V DC, < 3.5 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection **nozzle** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7112** (25 Pa): typically ±1 Pa **Type 7110** (100 Pa): typically ±2 Pa **Type 7111** (1000 Pa): typically ±5 Pa **Type 7115** (5000 Pa): typically ±25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ±1 % of final value ± 2 % of final value for pressure ranges < ±250 Pa
Temp. drift values:	± 0.1 % / °C ± 0.3 % / °C for pressure ranges < 250 Pa
Zero point offset:	< ± 0.7 % of final value ± 1.4 % of final value for pressure ranges < 250 Pa
Positive/negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**plastic**, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	see table

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

Dimensional drawing
[mm]

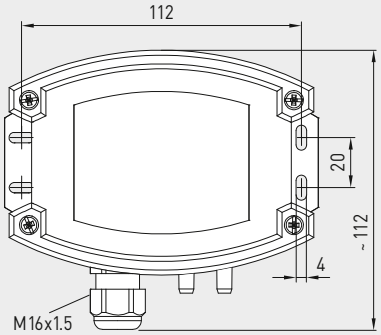
PREMASGARD® 711x

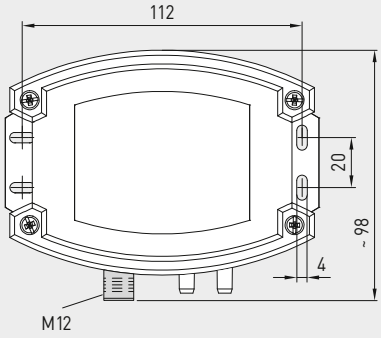


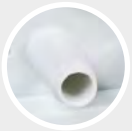


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

Housing with
M12 connector
equipped as standard with
pressure port **nozzles**







Pressure port
for pressure hose
(as standard)



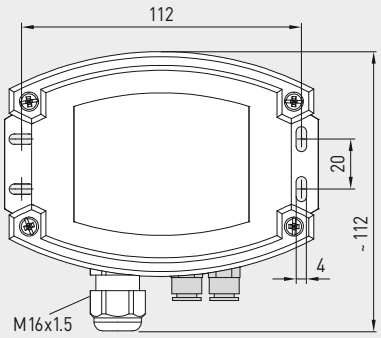
M12 connector
(male)

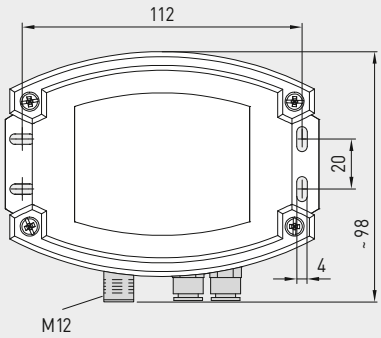
Dimensional drawing
[mm]

PREMASGARD® 711x

Housing with
cable gland
optional on request with
quick connect

Housing with
M12 connector
optional on request with
quick connect







Pressure port for
PVC/fabric pressure hose
(optional)



M12 connector
(male)

PREMASGARD® 711x
with cable gland
and display



PREMASGARD® 711x-Q
with M12 connector
and display





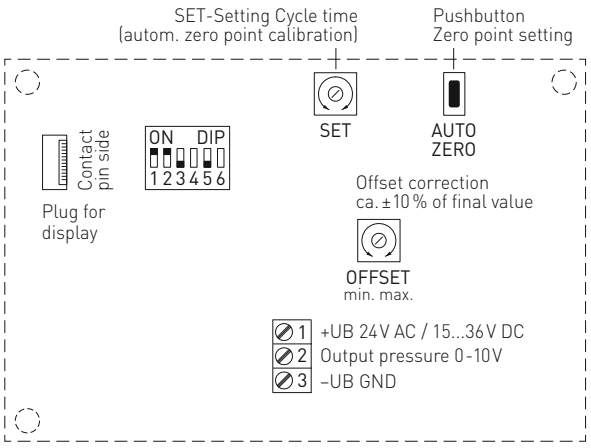
Pressure port for
PVC/fabric pressure hose
(optional)



Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

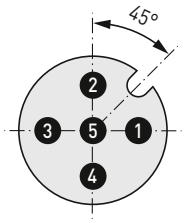
S+S REGELTECHNIK

Schematic diagram **PREMASGARD® 711x-U**



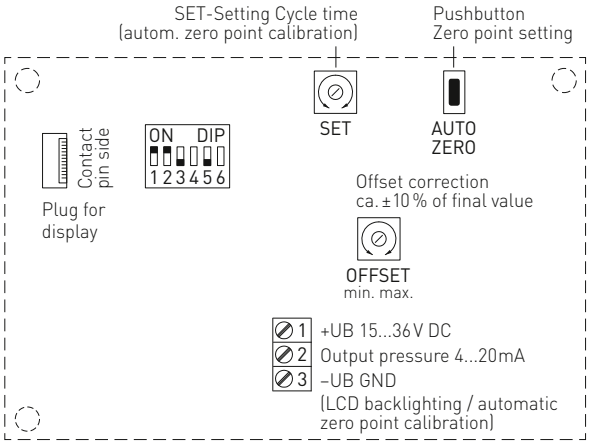
DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-U**



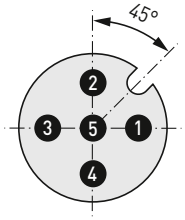
1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V [Pa]
3. free
4. –UB GND
5. Shield

Schematic diagram **PREMASGARD® 711x-I**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-I**



1. +UB 15...36 V DC
2. Output pressure 4...20 mA [Pa]
3. free
4. –UB GND (LCD backlighting / automatic zero point calibration)
5. Shield

Display with option
automatic zero point calibration



Standard
Actual pressure (in Pa)
Calibration interval (arrows)

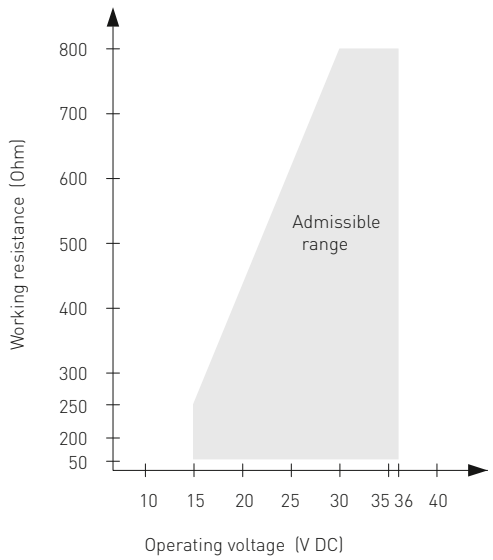


Zero point calibration active
Remaining calibration time (in seconds)



Adjustment of zero point calibration
Cycle time (15 min to 24 hours) adjustable by potentiometer.

Load resistance **PREMASGARD® 711x-I**



Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **711x-Q**
with display, hinged

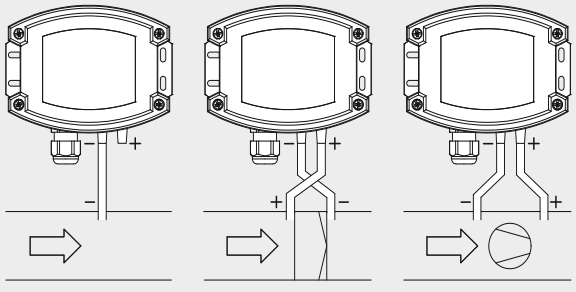


Pressure range (selectable) – max. measuring range (default) is depending to the type of device								**DIP 1**	**DIP 2**
0…25 Pa	0…50 Pa	0…100 Pa	0…1000 Pa	–25…+25 Pa	–50…+50 Pa	–100…+100 Pa	–1000…+1000 Pa	OFF	OFF
–	–	0…300 Pa	0…2000 Pa	–	–	–300…+300 Pa	–2000…+2000 Pa	**ON**	OFF
–	–	0…500 Pa	0…3000 Pa	–	–	–500…+500 Pa	–3000…+3000 Pa	OFF	**ON**
0…25 Pa	**0…100 Pa**	**0…1000 Pa**	**0…5000 Pa**	**–25…+25 Pa**	**–100…+100 Pa**	**–1000…+1000 Pa**	**–5000…+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0…+MR) (default)	OFF
Bidirectional (–MR…+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Mounting diagram **PREM**ASGARD® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

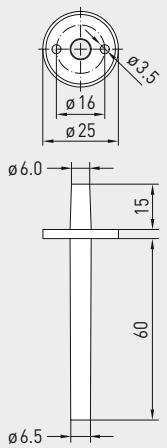
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

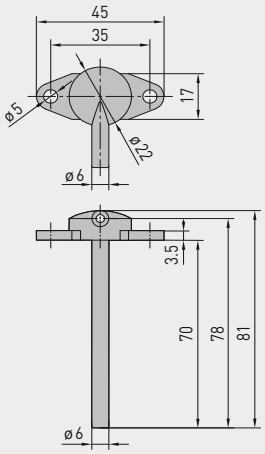
Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

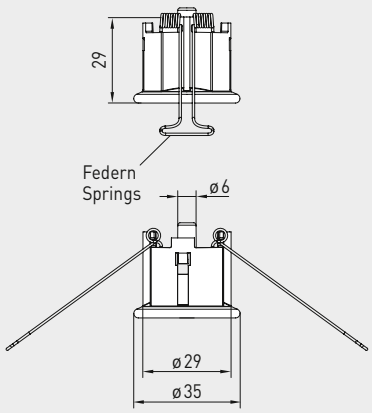
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

Pressure port for pressure hose (as standard)



Pressure port for PVC/fabric pressure hose (optional)



ACCESSORIES			
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see chapter Accessories!		

Pressure and differential pressure measuring transducers, including connection set, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **711x-Q**
with M12 connector



PREMASGARD® **711x**
with cable gland



PREMASGARD® **711x**	Pressure and differential pressure measuring transducers, *Deluxe*				
Pressure range (adjustable)	**Type / WG02**	**Output**	**Display** ● = **Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0...1000 Pa / –1000... +1000 Pa	PREMASGARD 7111-U	0-10 V		1301-7111-0010-200	**173,13 €**
	PREMASGARD 7111-U LCD	0-10 V	■	1301-7111-4010-200	**242,89 €**
	PREMASGARD 7111-I	4...20 mA		1301-7112-0010-100	**173,13 €**
	PREMASGARD 7111-I LCD	4...20 mA	■	1301-7112-4010-100	**242,89 €**
	PREMASGARD 7111-U **Q**	0-10 V	●	2004-6131-1100-001	**216,32 €**
	PREMASGARD 7111-U **Q** LCD	0-10 V	● ■	2004-6132-1100-001	**286,07 €**
	PREMASGARD 7111-I **Q**	4...20 mA	●	2004-6131-2100-001	**216,32 €**
	PREMASGARD 7111-I **Q** LCD	4...20 mA	● ■	2004-6132-2100-001	**286,07 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASGARD 7115-U	0-10 V		1301-7111-0050-200	**173,13 €**
	PREMASGARD 7115-U LCD	0-10 V	■	1301-7111-4050-200	**242,89 €**
	PREMASGARD 7115-I	4...20 mA		1301-7112-0050-100	**173,13 €**
	PREMASGARD 7115-I LCD	4...20 mA	■	1301-7112-4050-100	**242,89 €**
	PREMASGARD 7115-U **Q**	0-10 V	●	2004-6131-1100-011	**216,32 €**
	PREMASGARD 7115-U **Q** LCD	0-10 V	● ■	2004-6132-1100-021	**286,07 €**
	PREMASGARD 7115-I **Q**	4...20 mA	●	2004-6131-2100-011	**216,32 €**
	PREMASGARD 7115-I **Q** LCD	4...20 mA	● ■	2004-6132-2100-011	**286,07 €**
max. – 100...+ 100 Pa	**Type 7110**				
0... +50 Pa / –50... +50 Pa 0...+100 Pa / –100...+100 Pa	PREMASGARD 7110-U	0-10 V		1301-7111-0110-200	**217,98 €**
	PREMASGARD 7110-U LCD	0-10 V	■	1301-7111-4110-200	**280,26 €**
	PREMASGARD 7110-I	4...20 mA		1301-7112-0110-100	**217,98 €**
	PREMASGARD 7110-I LCD	4...20 mA	■	1301-7112-4110-100	**280,26 €**
	PREMASGARD 7110-U **Q**	0-10 V	●	2004-6131-1100-021	**261,16 €**
	PREMASGARD 7110-U **Q** LCD	0-10 V	● ■	2004-6132-1100-031	**323,43 €**
	PREMASGARD 7110-I **Q**	4...20 mA	●	2004-6131-2100-021	**261,16 €**
	PREMASGARD 7110-I **Q** LCD	4...20 mA	● ■	2004-6132-2100-021	**323,43 €**
max. – 25...+ 25 Pa	**Type 7112**				
0... +25 Pa / –25... +25 Pa *equipped as standard with automatic zero point calibration (3-wire connection)*	PREMASGARD 7112-U	0-10 V		1301-7111-0370-200	**279,01 €**
	PREMASGARD 7112-U LCD	0-10 V	■	1301-7111-4370-200	**330,34 €**
	PREMASGARD 7112-I	4...20 mA		1301-7112-0370-200	**279,01 €**
	PREMASGARD 7112-I LCD	4...20 mA	■	1301-7112-4370-200	**330,34 €**
	PREMASGARD 7112-U **Q**	0-10 V	●	2004-6131-1100-031	**322,20 €**
	PREMASGARD 7112-U **Q** LCD	0-10 V	● ■	2004-6132-1100-011	**373,52 €**
	PREMASGARD 7112-I **Q**	4...20 mA	●	2004-6131-3100-001	**322,20 €**
	PREMASGARD 7112-I **Q** LCD	4...20 mA	● ■	2004-6132-3100-011	**373,52 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional quick connect** for PVC fabric pressure hose Ø 6 mm				**51,32 €** **74,74 €** **43,20 €**

PREMASGARD® 711x-VA

**Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output**

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The calibratable pressure sensors **PREM**ASGARD® **711x-VA** (series) with eight switchable measuring ranges (eight devices in one), **stainless steel V4A** housing, optionally with/without display, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® **711x-VA**
with cable gland



TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	R_a (Ohm) = (U_b -14 V) / 0.02 A for I variant, see working resistance diagram
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 2 VA / 24 V DC, < 3.5 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure port:	with **quick connect** made from stainless steel for PVC/fabric pressure hose Ø 6 mm (external diameter) optionally with **pipe fitting** made from stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7112** (25 Pa): typically ±1 Pa **Type 7110** (100 Pa): typically ±2 Pa **Type 7111** (1000 Pa): typically ±5 Pa **Type 7115** (5000 Pa): typically ±25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ±1 % of final value ± 2 % of final value for pressure ranges < ±250 Pa
Temp. drift values:	± 0.1 % / °C ± 0.3 % / °C for pressure ranges < 250 Pa
Zero point offset:	< ± 0.7 % of final value ± 1.4 % of final value for pressure ranges < 250 Pa
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	(see table)

PREMASGARD® **711x-VAQ**
with M12 connector

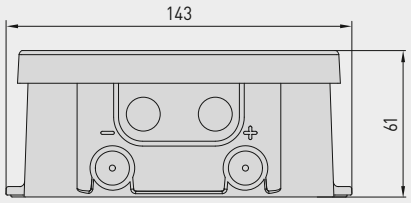


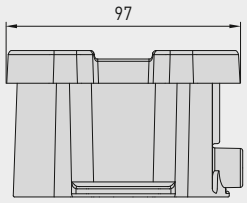
Pressure port for
PVC / fabric pressure hose
(as standard)



Dimensional drawing
[mm]

PREMASGARD® **711x-VA**



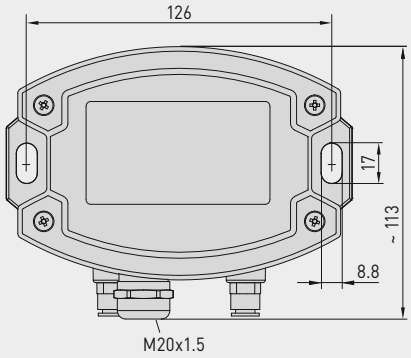


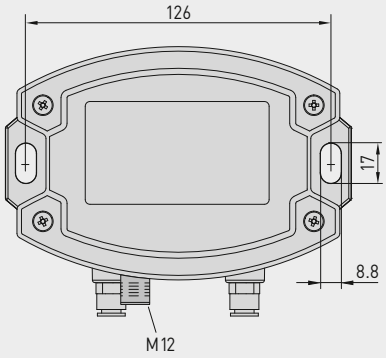
Housing with
cable gland

equipped as standard with
quick connect
for pressure hoses

Housing with
M12 connector

equipped as standard with
quick connect
for pressure hoses







Pressure port for
PVC / fabric pressure hose
(as standard)



M12 connector
(male)

Dimensional drawing
[mm]

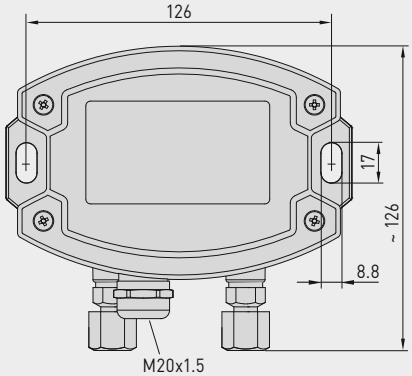
PREMASGARD® **711x-VA**

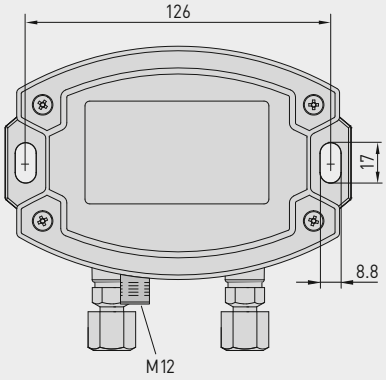
Housing with
cable gland

optional on request
with **pipe fitting**
for pressure lines

Housing with
M12 connector

optional on request
with **pipe fitting**
for pressure lines







Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

PREMASGARD® **711x-VA**
with cable gland
and display



PREMASGARD® **711x-VAQ**
with M12 connector
and display





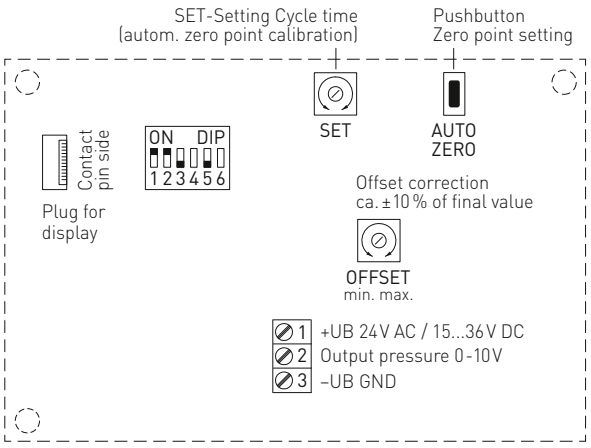
Pressure port
for pressure lines / pipes
(optional)



Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output

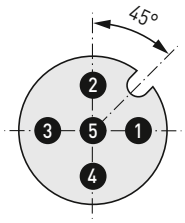
S+S REGELTECHNIK

Schematic diagram **PREMASGARD® 711x-U**



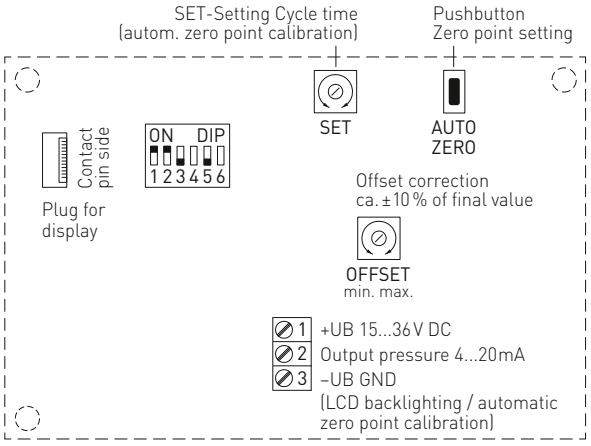
DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-U**



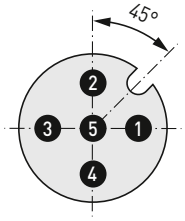
1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V [Pa]
3. free
4. –UB GND
5. Shield

Schematic diagram **PREMASGARD® 711x-I**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASGARD® 711x-I**



1. +UB 15...36 V DC
2. Output pressure 4...20 mA [Pa]
3. free
4. –UB GND (LCD backlighting / automatic zero point calibration)
5. Shield

Display with option
automatic zero point calibration



Standard
Actual pressure (in Pa)
Calibration interval (arrows)

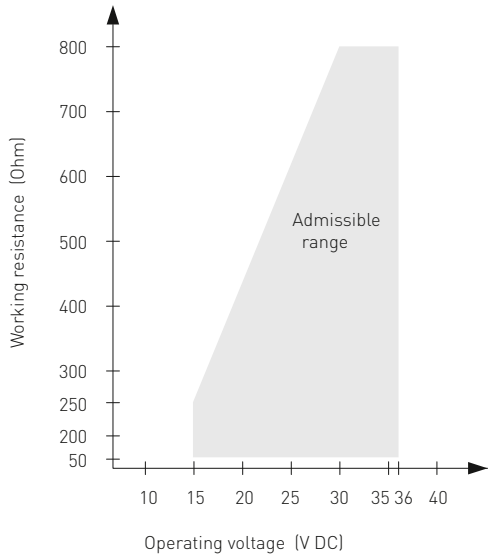


Zero point calibration active
Remaining calibration time (in seconds)



Adjustment of zero point calibration
Cycle time (15 min to 24 hours) adjustable by potentiometer.

Load resistance **PREMASGARD® 711x-I**



Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® **711x-VAQ**
with display,
hinged

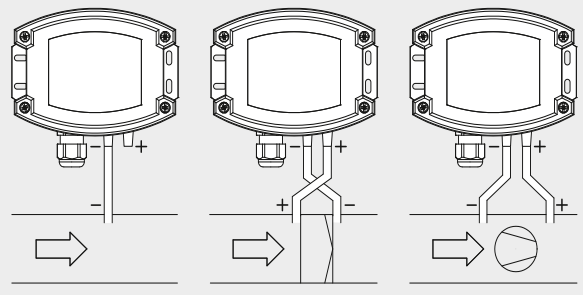


Pressure range (selectable) – max. measuring range (default) is depending to the type of device								**DIP 1**	**DIP 2**
0...25 Pa	0...50 Pa	0...100 Pa	0...1000 Pa	–25...+25 Pa	–50...+50 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
–	–	0...300 Pa	0...2000 Pa	–	–	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
–	–	0...500 Pa	0...3000 Pa	–	–	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...25 Pa	**0...100 Pa**	**0...1000 Pa**	**0...5000 Pa**	**–25...+25 Pa**	**–100...+100 Pa**	**–1000...+1000 Pa**	**–5000...+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Mounting diagram **PREM**ASGARD® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output

S+S REGELTECHNIK

PREMASGARD® **711x-VAQ**
with M12 connector



PREMASGARD® **711x-VAQ**	Pressure and differential pressure measuring transducer, *ID* Stainless steel housing with M12 connector				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display** ● = **Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / –1000... + 1000 Pa	PREMASGARD 7111-U VA**Q**	0-10 V	●	2004-6191-1100-001	**575,50 €**
	PREMASGARD 7111-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-001	**762,42 €**
	PREMASGARD 7111-I VA**Q**	4...20 mA	●	2004-6191-2100-001	**575,50 €**
	PREMASGARD 7111-I VA**Q** LCD	4...20 mA	● ■	2004-6192-2100-001	**762,42 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0... 1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASGARD 7115-U VA**Q**	0-10 V	●	2004-6191-1100-011	**575,50 €**
	PREMASGARD 7115-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-011	**762,42 €**
	PREMASGARD 7115-I VA**Q**	4...20 mA	●	2004-6191-2100-011	**575,50 €**
	PREMASGARD 7115-I VA**Q** LCD	4...20 mA	● ■	2004-6192-2100-011	**762,42 €**
max. – 100...+ 100 Pa	**Type 7110**				
0... +50 Pa / –50... +50 Pa 0...+100 Pa /–100...+100 Pa	PREMASGARD 7110-U VA**Q**	0-10 V	●	2004-6191-1100-021	**639,72 €**
	PREMASGARD 7110-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-021	**818,47 €**
	PREMASGARD 7110-I VA**Q**	4...20 mA	●	2004-6191-2100-021	**639,72 €**
	PREMASGARD 7110-I VA**Q** LCD	4...20 mA	● ■	2004-6192-2100-021	**818,47 €**
max. – 25...+ 25 Pa	**Type 7112**				
0... +25 Pa / –25... +25 Pa *equipped as standard with automatic zero point calibration (3-wire connection)*	PREMASGARD 7112-U VA**Q**	0-10 V	●	2004-6191-1100-031	**731,27 €**
	PREMASGARD 7112-U VA**Q** LCD	0-10 V	● ■	2004-6192-1100-031	**893,58 €**
	PREMASGARD 7112-I VA**Q**	4...20 mA	●	2004-6191-3100-001	**731,27 €**
	PREMASGARD 7112-I VA**Q** LCD	4...20 mA	● ■	2004-6192-3100-001	**893,58 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **5-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**51,32 €** **74,74 €** **43,20 €**

ACCESSORIES

xx-M12	**Special accessories for M12 connector**
	For further information, see chapter Accessories!

Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output



PREMASGARD® **711x-VA**
with cable gland

PREMASGARD® **711x-VA**	Pressure and differential pressure measuring transducer, *ID* Stainless steel housing with cable gland				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0...1000 Pa / –1000... + 1000 Pa	PREMASGARD 7111-U VA	0-10 V		2004-6191-1200-001	**538,87 €**
	PREMASGARD 7111-U VA LCD	0-10 V	■	2004-6192-1200-001	**722,72 €**
	PREMASGARD 7111-I VA	4...20 mA		2004-6191-2200-001	**538,87 €**
	PREMASGARD 7111-I VA LCD	4...20 mA	■	2004-6192-2200-001	**722,72 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASGARD 7115-U VA	0-10 V		2004-6191-1200-011	**538,87 €**
	PREMASGARD 7115-U VA LCD	0-10 V	■	2004-6192-1200-011	**722,72 €**
	PREMASGARD 7115-I VA	4...20 mA		2004-6191-2200-011	**538,87 €**
	PREMASGARD 7115-I VA LCD	4...20 mA	■	2004-6192-2200-011	**722,72 €**
max. – 100...+ 100 Pa	**Type 7110**				
0... +50 Pa / –50... +50 Pa 0...+100 Pa / –100...+100 Pa	PREMASGARD 7110-U VA	0-10 V		2004-6191-1200-021	**600,02 €**
	PREMASGARD 7110-U VA LCD	0-10 V	■	2004-6192-1200-021	**778,76 €**
	PREMASGARD 7110-I VA	4...20 mA		2004-6191-2200-021	**600,02 €**
	PREMASGARD 7110-I VA LCD	4...20 mA	■	2004-6192-2200-021	**778,76 €**
max. – 25...+ 25 Pa	**Type 7112**				
0... +25 Pa / –25... +25 Pa *equipped as standard with automatic zero point calibration (3-wire connection)*	PREMASGARD 7112-U VA	0-10 V		2004-6191-1200-031	**691,57 €**
	PREMASGARD 7112-U VA LCD	0-10 V	■	2004-6192-1200-031	**853,89 €**
	PREMASGARD 7112-I VA	4...20 mA		2004-6191-3200-001	**691,57 €**
	PREMASGARD 7112-I VA LCD	4...20 mA	■	2004-6192-3200-001	**853,89 €**
Housing variant:	Cable connection with **cable gland** made from stainless steel V2A (1.4305)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**51,32 €** **74,74 €** **43,20 €**



Pressure port for PVC / fabric pressure hose (as standard)



Pressure port for pressure lines / pipes (optional)

PREMASGARD® 722x

Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable dual pressure sensor **PREM**ASGARD® **722x** (series) with 2 x 8 switchable measuring ranges, 2 automated output signals (32 devices in one), housing with pressure connection nozzle from impact-resistant plastic, optionally with/without display, with cable gland or M12 connector acc. to DIN EN 61076-2-101 for measuring overpressure, underpressure or differential pressure of the air. The pressure measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0-10 V or 4...20 mA (**Automatic Output Switching**).

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with this pressure measuring transducer are clean air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

Both pressure sensors with piezoresistive measuring element are temperature-compensated and guarantee a high level of reliability and accuracy. The device has a push-button for manual zero point matching as well as an offset potentiometer for correcting the final value. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes a connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws).

TECHNICAL DATA

Power supply:	24 V AC/DC (± 10%)
Working resistance:	R_a (ohms) = 25...450 Ohm (at I output)
Load resistance:	R_L > 15 kOhm (at U output)
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Pressure type:	differential pressure (**2 measuring channels**)
Measuring ranges:	**Multi-range switching** **with 2 x 8 switchable measuring ranges** (see table)
Accuracy:	**Type 722x** (500 Pa): typical ± 13 Pa **Type 722x** (7000 Pa): typical ± 105 Pa compared to a calibrated reference device
Pressure connection:	with connection nozzle for pressure hose Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C (temperature-compensated 0...+50 °C)
Temp. drift values:	± 0.1 % / °C final value
Zero point offset:	± 10 % measuring range
Above-/below-pressure:	± 50 kPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switch)
Output:	**automatically 0-10 V / 4...20 mA** (via **Automatic Output Switching** – the device detects the required output type and automatically switches to U or I output)
Switching type:	3-wire connection
electrical connection:	0.2–1.5 mm², via push-in clamp
Cable connection:	**cable gland** from plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Philips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Safety class:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity, electro-magnetic compatibility according to EN 61326, EMC Directive 2014 / 30 / EU
Features:	**Illuminated display,** 3 lines, cut-out approx. 70 x 40 mm (W x H), to display the ACTUAL pressure of both channels (cyclical)
ACCESSORIES	see table

PREMASGARD® **722x**
with cable gland



PREMASGARD® **722x-Q**
with M12 connector



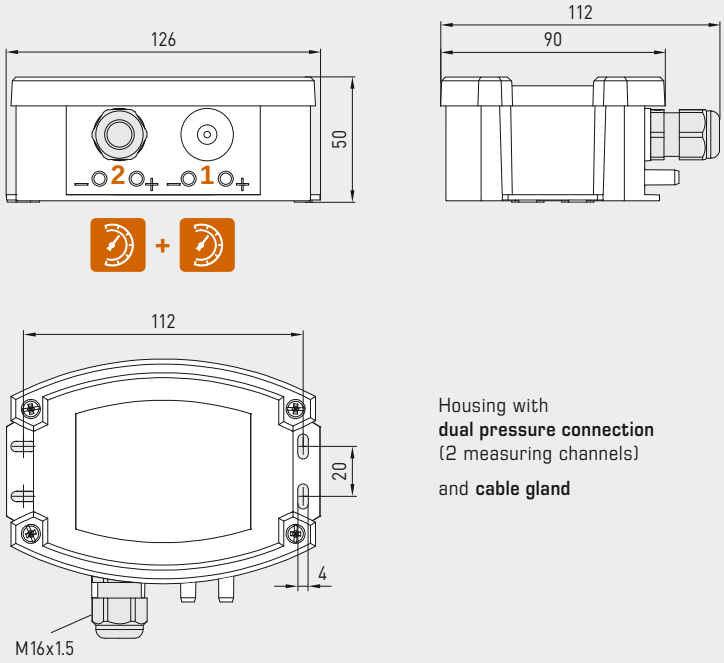


Dual pressure connection
Housing with cable gland



Dimensional drawing
[mm]

PREMASGARD® **722x**



Housing with
dual pressure connection
(2 measuring channels)

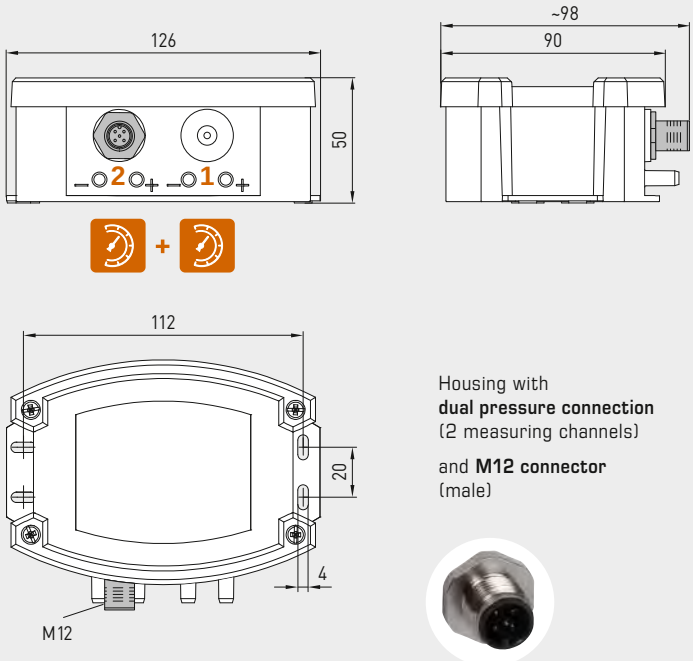
and **cable gland**

PREMASGARD® **722x**
with cable gland
and display



Dimensional drawing
[mm]

PREMASGARD® **722x-Q**



Housing with
dual pressure connection
(2 measuring channels)

and **M12 connector**
(male)

PREMASGARD® **722x-Q**
with M12 connector
and display





Dual pressure connection
Housing with
M12 connector



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

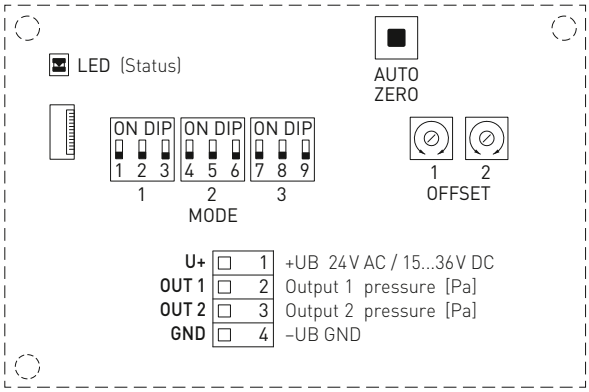
AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

PREMASGARD® 722x

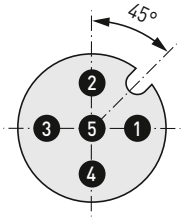
Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

S+S REGELTECHNIK

Schematic diagram — **PREM**ASGARD® **722x**



Pin assignment (M12) — **PREM**ASGARD® **722x**



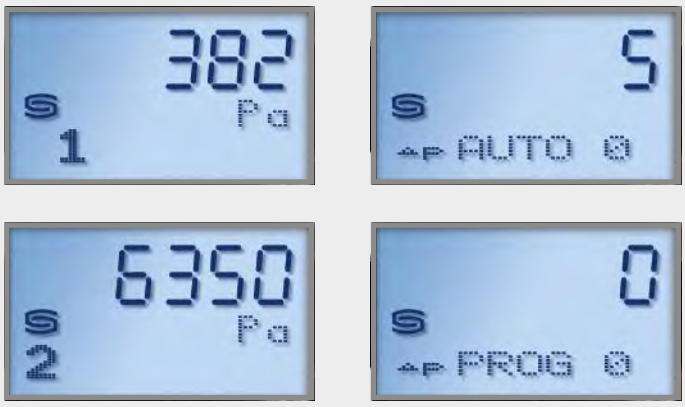
1. +UB 24 V AC / 15...36 V DC
2. Output 1 pressure [Pa]
3. Output 2 pressure [Pa]
4. –UB GND
5. Shield

Pressure range adjustable depending on type		Measuring channel 1			Measuring channel 2		
max. ±500 Pa	max. ±7000 Pa	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6
0...+100 Pa	0...+1000 Pa	OFF	OFF	OFF	OFF	OFF	OFF
0...+200 Pa	0...+3000 Pa	**ON**	OFF	OFF	**ON**	OFF	OFF
0...+300 Pa	0...+5000 Pa	OFF	**ON**	OFF	OFF	**ON**	OFF
0...+500 Pa	**0...+7000 Pa**	**ON**	**ON**	OFF	**ON**	**ON**	OFF
–100...+100 Pa	–1000...+1000 Pa	OFF	OFF	**ON**	OFF	OFF	**ON**
–200...+200 Pa	–3000...+3000 Pa	**ON**	OFF	**ON**	**ON**	OFF	**ON**
–300...+300 Pa	–5000...+5000 Pa	OFF	**ON**	**ON**	OFF	**ON**	**ON**
–500...+500 Pa	**–7000...+7000 Pa**	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**

Mode Measurement signal filtering	
Selectable time interval	DIP 7
10 s (default)	OFF
1 s	**ON**

Note:
DIP 8 and 9 are not defined!

Displays — **PREM**ASGARD® **722x**



Default display
Measured value

Actual pressure (Pa) of both channels is shown cyclically (Interval approx. 6 seconds).

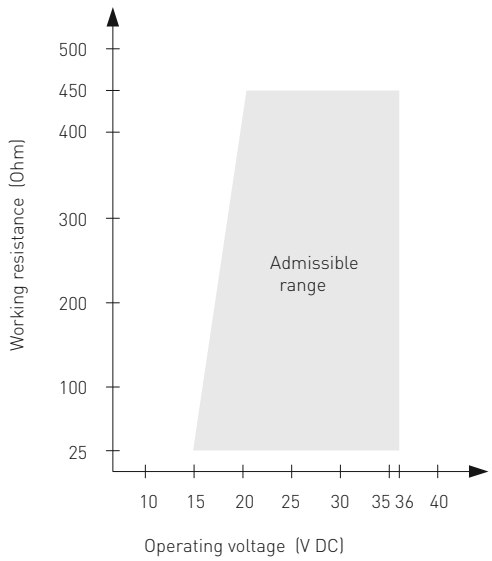
The associated measuring channel is shown on the bottom left.

Status display
zero point calibration

Remaining calibration time is shown (in seconds).

Change from "AUTO 0" to "PROG 0" shows that matching was correct.

Working resistance diagram (4...20 mA) — **PREM**ASGARD® **722x**

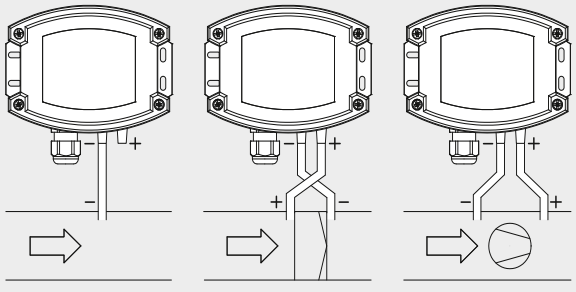


Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

PREMASGARD® **722x-Q**
with display, hinged



Mounting diagram **PREM**ASGARD® **722x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

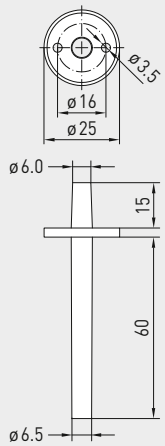
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

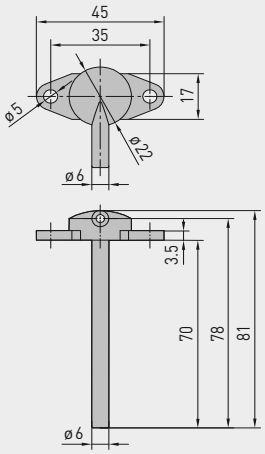
Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

S+S REGELTECHNIK

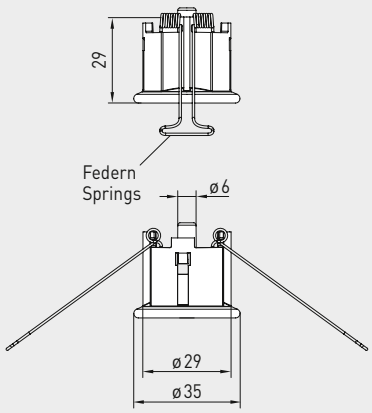
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

ACCESSORIES			
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see chapter Accessories!		

Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, incl. connection set, calibratable, with multi-range switching and active output (Automatic Output Switching)

PREMASGARD® **722x-Q**
with M12 connector



PREMASGARD® **722x**
with cable gland



PREMASGARD® **722x**	Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, *Deluxe*				
Pressure range (adjustable per channel)	**Type / WG02**	**Output** (automatically)	**Display** ● = **Q**	**Item No.**	**Price**
(1) max. – 500...+ 500 Pa **(2) max. – 500...+ 500 Pa**	**Type 7225**				
Channel (1) and (2): 0 ... 100 Pa / – 100 ... + 100 Pa 0 ... 200 Pa / – 200 ... + 200 Pa 0 ... 300 Pa / – 300 ... + 300 Pa 0 ... 500 Pa / – 500 ... + 500 Pa	PREMASGARD 7225	0-10 V / 4...20 mA		1301-712A-0910-200	**235,94 €**
	PREMASGARD 7225 LCD	0-10 V / 4...20 mA	■	1301-712A-4910-200	**286,16 €**
	PREMASGARD 7225 **Q**	0-10 V / 4...20 mA	●	2004-6331-B100-021	**283,92 €**
	PREMASGARD 7225 **Q** LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-021	**335,66 €**
(1) max. – 7000...+ 7000 Pa **(2) max. – 7000...+ 7000 Pa**	**Type 7227**				
Channel (1) and (2): 0 ... 1000 Pa / – 1000 ... + 1000 Pa 0 ... 3000 Pa / – 3000 ... + 3000 Pa 0 ... 5000 Pa / – 5000 ... + 5000 Pa 0 ... 7000 Pa / – 7000 ... + 7000 Pa	PREMASGARD 7227	0-10 V / 4...20 mA		1301-712A-0950-200	**235,94 €**
	PREMASGARD 7227 LCD	0-10 V / 4...20 mA	■	1301-712A-4950-200	**286,16 €**
	PREMASGARD 7227 **Q**	0-10 V / 4...20 mA	●	2004-6331-B100-011	**283,92 €**
	PREMASGARD 7227 **Q** LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-011	**335,66 €**
(1) max. – 500... + 500 Pa **(2) max. – 7000...+ 7000 Pa**	**Type 7229**				
Channel (1): 0 ... 100 Pa / – 100 ... + 100 Pa 0 ... 200 Pa / – 200 ... + 200 Pa 0 ... 300 Pa / – 300 ... + 300 Pa 0 ... 500 Pa / – 500 ... + 500 Pa Channel (2): 0 ... 1000 Pa / – 1000 ... + 1000 Pa 0 ... 3000 Pa / – 3000 ... + 3000 Pa 0 ... 5000 Pa / – 5000 ... + 5000 Pa 0 ... 7000 Pa / – 7000 ... + 7000 Pa	PREMASGARD 7229	0-10 V / 4...20 mA		1301-712A-0930-200	**235,94 €**
	PREMASGARD 7229 LCD	0-10 V / 4...20 mA	■	1301-712A-4930-200	**286,16 €**
	PREMASGARD 7229 **Q**	0-10 V / 4...20 mA	●	2004-6331-B100-001	**283,92 €**
	PREMASGARD 7229 **Q** LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-001	**335,66 €**
Multi-range switching:	The **pressure ranges** depend on the device type and for each measuring channel, they are separately adjustable via DIP switch.				
Automatic Output Switching:	Patented analogue interface **(patent no. DE 10 2015 015 941 B4)** Device automatically detects the required output type 0–10 V or 4...20 mA.				
Housing variant Q:	Cable connection with **M12 connector** (male, **5 pin**, A-code)				

Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

S+S REGELTECHNIK

The electronic **PREM**ASREG® **711x** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switch-point and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch / differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from impact-resistant plastic, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) and one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

TECHNICAL DATA

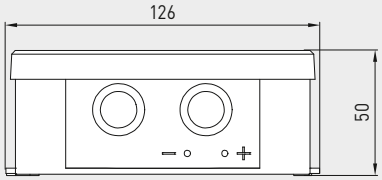
Power supply:	24 V AC / DC (± 20 %)
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection **nozzle** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7111** (1000 Pa): typically ± 5 Pa **Type 7115** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Zero point offset:	< ± 0.7 % of final value
Setting increment Δp:	1 % of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	± 1 % of pressure range (100 Pa => ± 1 Pa; 5000 Pa => ± 50 Pa)
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**plastic**, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Typ 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and / or SETPOINT pressure as well as automatic zero point calibration
ACCESSORIES	see table

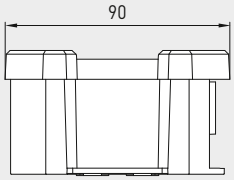
Pressure port
for pressure hose
(as standard)



Dimensional drawing
[mm]

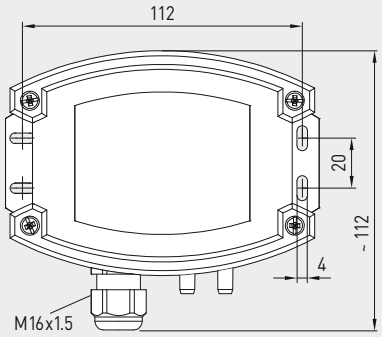
PREMASREG® **711x**

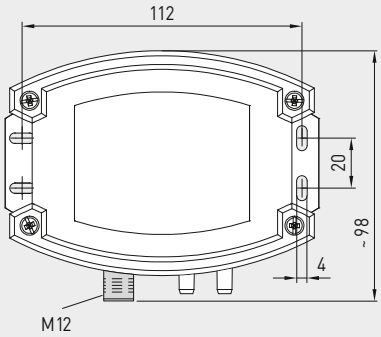


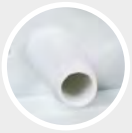


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

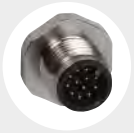
Housing with
M12 connector
equipped as standard with
pressure port **nozzles**







Pressure port
for pressure hose
(as standard)



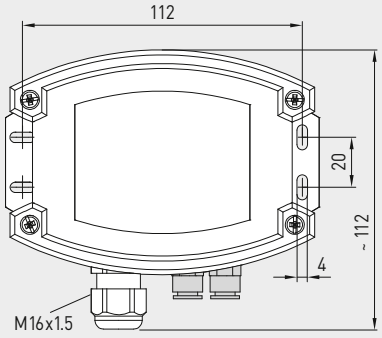
M12 connector
(male)

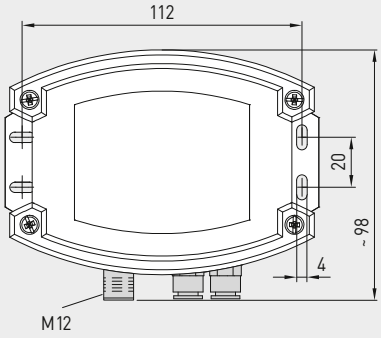
Dimensional drawing
[mm]

PREMASREG® **711x**

Housing with
cable gland
optional on request with
quick connect

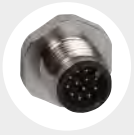
Housing with
M12 connector
optional on request with
quick connect







Pressure port for
PVC/fabric pressure hose
(optional)



M12 connector
(male)

PREMASREG® **711x-Q**
with cable gland
and display



PREMASREG® **711x-Q**
with M12 connector
and display





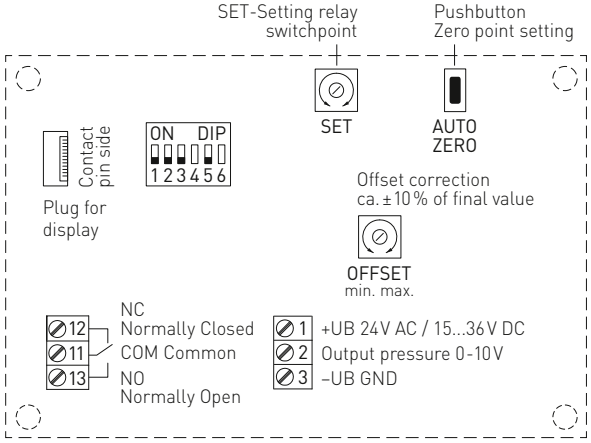
Pressure port for
PVC/fabric pressure hose
(optional)



Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

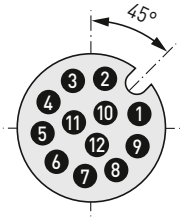
S+S REGELTECHNIK

Schematic diagram — **PREMASREG® 711x-UW**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) — **PREMASREG® 711x-UW**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Pressure range (selectable) – max. measuring range (default) is depending to the type of device				**DIP 1**	**DIP 2**
0...100 Pa	0...1000 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
0...500 Pa	0...3000 Pa	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...1000 Pa	**0...5000 Pa**	**-1000...+1000 Pa**	**-5000...+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Display with option
automatic zero point calibration



Zero point calibration active
Remaining calibration time (in seconds)

Cycle time (approx. 90 minutes) is fixed in the factory.

Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

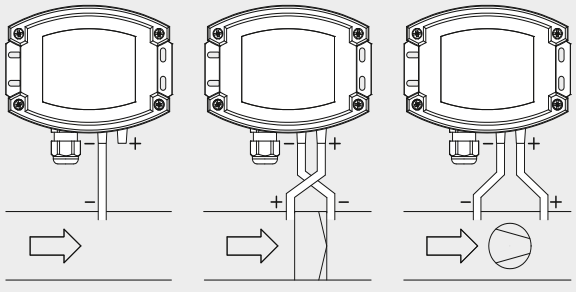
PREMASREG® **711x - Q**
with display,
hinged







Mounting diagram **PREM**ASREG® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

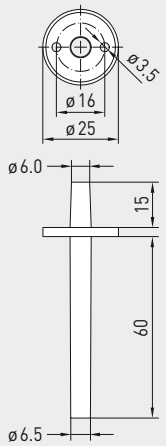
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

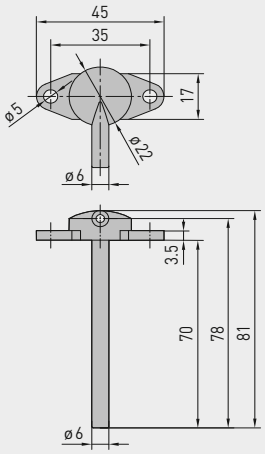
Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

S+S REGELTECHNIK

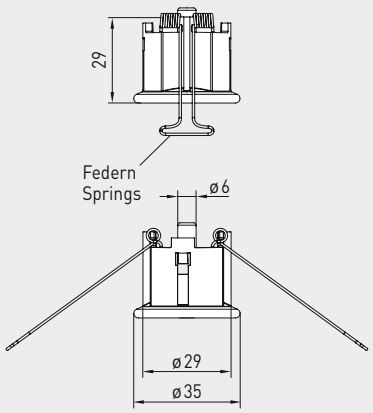
Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



Dimensional drawing [mm] **DAL-01**



ASD-06
Connection set



ASD-07
Connection nipple



DAL-01
Pressure outlet





WS-03
Weather and sun protection hood (optional)

Pressure port for pressure hose (as standard)



Pressure port for PVC/fabric pressure hose (optional)



ACCESSORIES			
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
DAL-01	**Pressure outlet** for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	**36,84 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see chapter Accessories!		

Pressure and differential pressure measuring transducers/switches, incl. connection set, with multi-range switching and adjustable, switching and active output

PREMASREG® **711x-Q**
with M12 connector



PREMASREG® **711x**
with cable gland



PREMASREG® **711x**	Pressure and differential pressure measuring transducers/switches, *Deluxe* (with cable gland or M12 connector)				
Pressure range (adjustable)	**Type / WG02**	**Output**	**Display ● = Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASREG 7111-UW LCD	0-10 V 1x Changeover contact	■	1302-7111-4011-200	**247,87 €**
	PREMASREG 7111-UW **Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-001	**291,07 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASREG 7115-UW LCD	0-10 V 1x Changeover contact	■	1302-7111-4051-200	**247,87 €**
	PREMASREG 7115-UW **Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-011	**291,07 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional quick connect** for PVC fabric pressure hose Ø 6 mm				**51,32 €** **74,74 €** **43,20 €**

PREMASREG® 711x-VA

**Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output**

S+S REGELTECHNIK

The electronic **PREM**ASREG® **711x-VA** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switchpoint and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch / differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) as well as one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

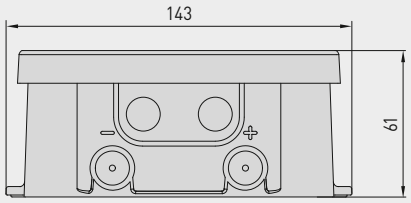
Power supply:	24 V AC / DC (± 20 %)
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Measuring ranges:	**multi-range switching** **with 8 switchable measuring ranges** (see table)
Type of pressure:	differential pressure
Pressure port:	with **quick connect** made from stainless steel for PVC/fabric pressure hose Ø 6 mm (external diameter) optionally with **pipe fitting** made from stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7111** (1000 Pa): typically ± 5 Pa **Type 7115** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Zero point offset:	< ± 0.7 % of final value
Setting increment Δp:	1 % of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	± 1 % of pressure range (100 Pa => ± 1 Pa; 5000 Pa => ± 50 Pa)
Positive /negative pressure:	max. ± 100 hPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and / or SETPOINT pressure as well as automatic zero point calibration
ACCESSORIES	(see table)

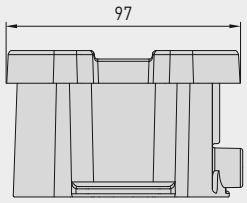
Pressure port for
PVC / fabric pressure hose
(as standard)



Dimensional drawing
[mm]

PREMASREG® **711x-VA**



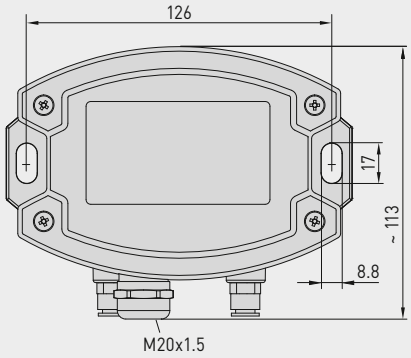


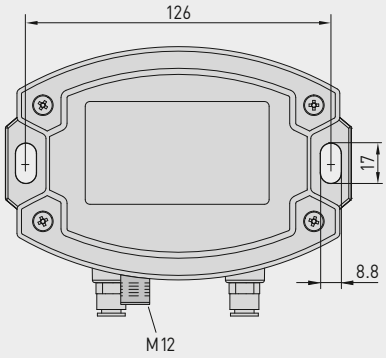
Housing with
cable gland

equipped as standard with
quick connect
for pressure hoses

Housing with
M12 connector

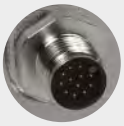
equipped as standard with
quick connect
for pressure hoses







Pressure port for
PVC / fabric pressure hose
(as standard)



M12 connector
(male)

PREMASREG® **711x-VA**
with cable gland
and display



PREMASREG® **711x-VAQ**
with M12 connector
and display





Dimensional drawing
[mm]

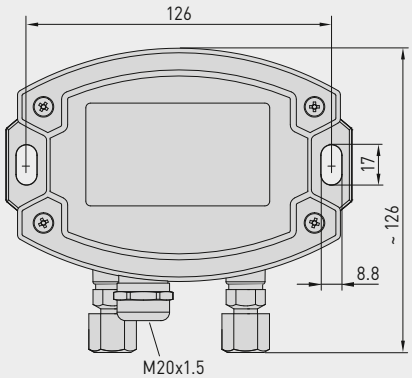
PREMASREG® **711x-VA**

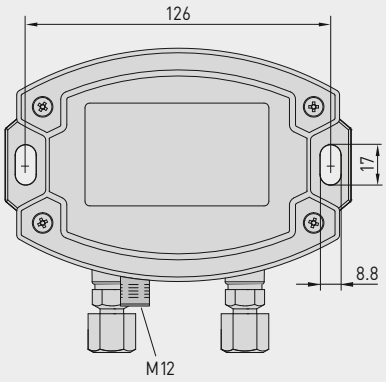
Housing with
cable gland

optional on request
with **pipe fitting**
for pressure lines

Housing with
M12 connector

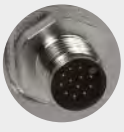
optional on request
with **pipe fitting**
for pressure lines







Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

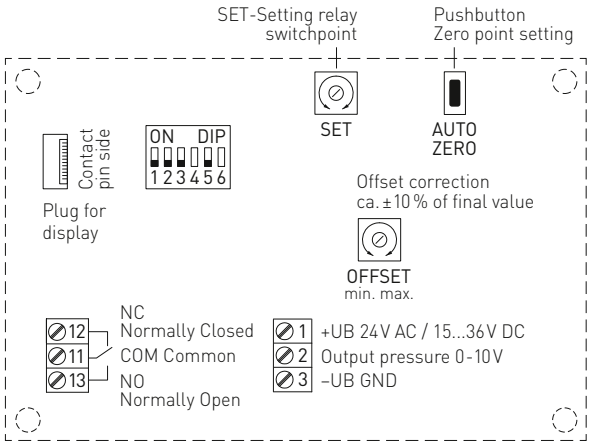
Pressure port
for pressure lines / pipes
(optional)



Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

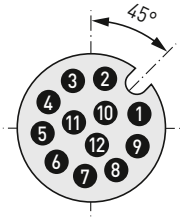
S+S REGELTECHNIK

Schematic diagram **PREMASREG® 711x-UW**



DIP switches 4 and 6 are not assigned!

Pin assignment (M12) **PREMASREG® 711x-UW**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10 V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Pressure range (selectable) – max. measuring range (default) is depending to the type of device				**DIP 1**	**DIP 2**
0...100 Pa	0...1000 Pa	–100...+100 Pa	–1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	–300...+300 Pa	–2000...+2000 Pa	**ON**	OFF
0...500 Pa	0...3000 Pa	–500...+500 Pa	–3000...+3000 Pa	OFF	**ON**
0...1000 Pa	**0...5000 Pa**	**-1000...+1000 Pa**	**-5000...+5000 Pa**	**ON**	**ON**

Measuring range mode (Mode selectable)	**DIP 3**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Display with option **automatic zero point calibration**



Zero point calibration active
Remaining calibration time (in seconds)

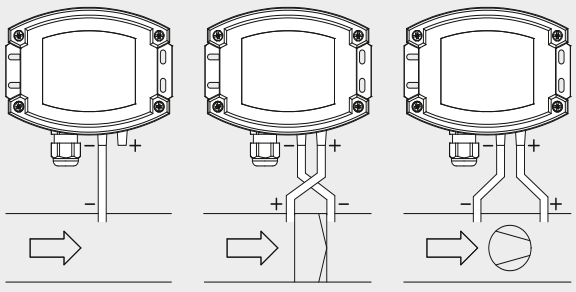
Cycle time (approx. 90 minutes) is fixed in the factory.

Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

PREMASREG® **711x-VAQ**
with display, hinged



Mounting diagram **PREM**ASREG® **711x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected
but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching and active output

S+S REGELTECHNIK

PREMASREG® **711x-VAQ**
with M12 connector



PREMASREG® **711x-VAQ**	Pressure and differential pressure measuring transducers/switches, *ID* (Stainless steel housing with M12 connector)				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display ● = Q**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASREG 7111-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-001	**769,87 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0... 1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASREG 7115-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-011	**769,87 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**51,32 €** **74,74 €** **43,20 €**

ACCESSORIES

xx-M12	**Special accessories for M12 connector**
	For further information, see chapter Accessories!

PREMASREG® **711x-VA**
with cable gland



PREMASREG® **711x-VA**	Pressure and differential pressure measuring transducers/switches, *ID* (Stainless steel housing with cable gland)				
Pressure range (adjustable)	**Type / WG02I**	**Output**	**Display**	**Item No.**	**Price**
max. – 1000...+ 1000 Pa	**Type 7111**				
0... 100 Pa / – 100... + 100 Pa 0... 300 Pa / – 300... + 300 Pa 0... 500 Pa / – 500... + 500 Pa 0... 1000 Pa / – 1000... + 1000 Pa	PREMASREG 7111-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-001	**730,20 €**
max. – 5000...+ 5000 Pa	**Type 7115**				
0...1000 Pa / – 1000 ... + 1000 Pa 0...2000 Pa / – 2000 ... + 2000 Pa 0...3000 Pa / – 3000 ... + 3000 Pa 0...5000 Pa / – 5000 ... + 5000 Pa	PREMASREG 7115-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-011	**730,20 €**
Housing variant:	Cable connection with **cable gland** made from stainless steel V2A (1.4305)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa **with optional automatic zero point calibration** **with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**51,32 €** **74,74 €** **43,20 €**



Pressure port for
PVC / fabric pressure hose
(as standard)



Pressure port for
pressure lines / pipes
(optional)

PREMASREG® 716x

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

S+S REGELTECHNIK

The electronic **PREM**ASREG® **716x** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from impact-resistant plastic, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) are fitted with one switching output, one continuous output and one backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. A connection set **ASD-06** (2 m connection hose, two pressure nipples, screws) is included in the scope of supply.

TECHNICAL DATA

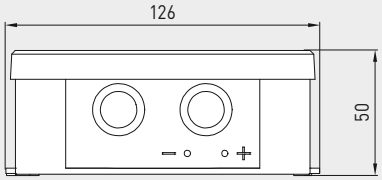
Power supply:	24 V AC / DC (± 10 %) and 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 V AC
Measuring function:	**Volume flow, differential pressure, filter monitoring, fill level** (adjustable)
Measuring ranges:	**10...100%** (adjustable)
Type of pressure:	differential pressure
Pressure connection:	with connection **nozzle** for pressure hose Ø 6 mm, optionally with **quick** connect made from stainless steel for PVC fabric pressure hose Ø 6 mm (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7161** (1000 Pa): typically ± 5 Pa **Type 7165** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value (pressure)
Temp. drift values:	± 0.1 % / °C
Positive / negative pressure:	max. ± 10000 Pa
Signal hysteresis:	± 1 % of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**plastic**, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the **volume flow, differential pressure, contamination degree** or **level** and for setting the **switchpoint, K factor, measuring range limits** and other settings
K factor:	**1 to 3000** (adjustable)
Units:	**m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm** (adjustable)
Max. value displayed:	999999
ACCESSORIES	see table

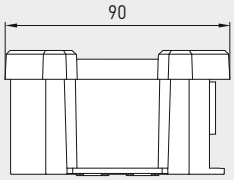
Pressure port for pressure hose (as standard)



Dimensional drawing
[mm]

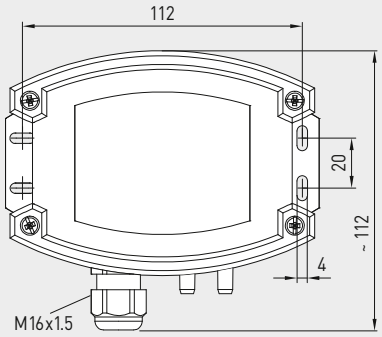
PREMASREG® **716x**

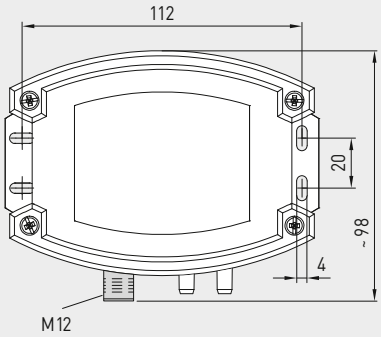


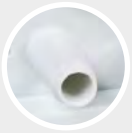


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

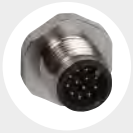
Housing with
M12 connector
equipped as standard with
pressure port **nozzles**







Pressure port
for pressure hose
(as standard)



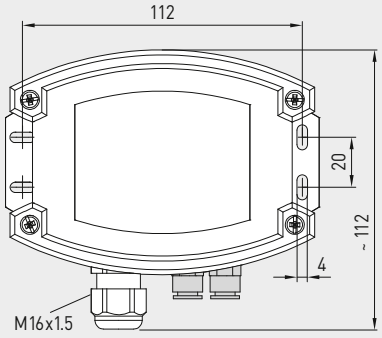
M12 connector
(male)

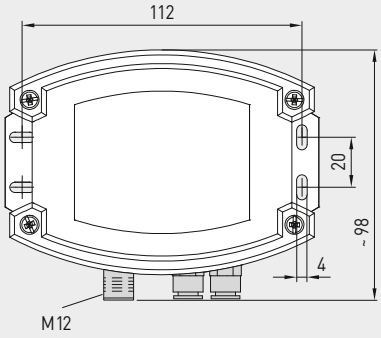
Dimensional drawing
[mm]

PREMASREG® **716x**

Housing with
cable gland
optional on request
with **quick** connect

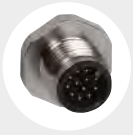
Housing with
M12 connector
optional on request
with **quick** connect







Pressure port for
PVC/fabric pressure hose
(optional)



M12 connector
(male)

PREMASREG® **716x**
with cable gland
and display



PREMASREG® **716x-Q**
with M12 connector
and display





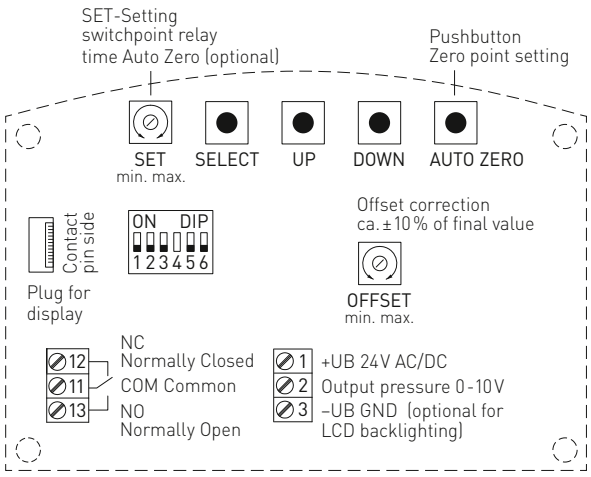
Pressure port for
PVC/fabric pressure hose
(optional)



Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

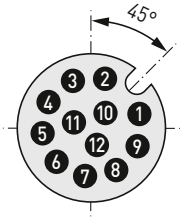
S+S REGELTECHNIK

Schematic diagram — **PREMASREG® 716x-UW**



DIP switch 4 is not assigned!

Pin assignment (M12) — **PREMASREG® 716x-UW**



1. +UB 24V AC / 15...36V DC
2. Output pressure 0-10V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Measuring range mode (Mode selectable)	**DIP 1**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Small value suppression (measured values < 1% of end value (pressure) = 0)	**DIP 2**
Deactivated (default)	OFF
Active	**ON**

Relay (Function adjustable)	**DIP 3**
Deactivated (default)	OFF
Active (display shows switching point)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Service mode (display adjustable)	**DIP 6**
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	**ON**

PREMASREG® 716x
Function types



Volumolume flow rate

$$V = k \cdot \sqrt{\Delta p}$$

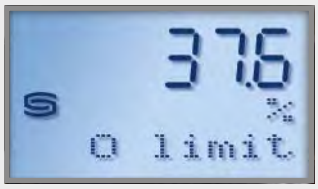
V = Volume flow in m³/h
k = K factor 1...3000
Δp = Differential pressure in Pa



Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
p_+ = higher pressure
p_- = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
Δp = Differential pressure in Pa
p_{Filter} = differential pressure filter replacement in Pa



Level display

$$h = \Delta p \div (\rho \cdot g)$$

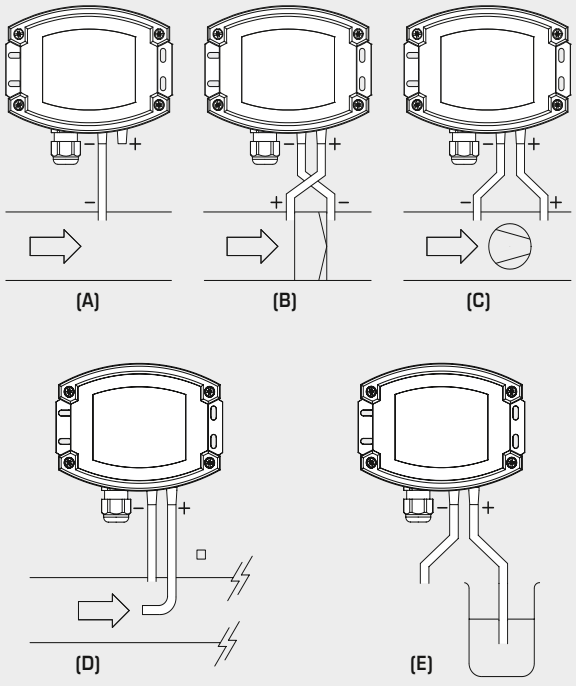
h = Fill level height in cm
Δp = Differential pressure in Pa
ρ = Density 700...1300 in kg/m³
g = 9.81 m/s²

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

PREMASREG® **716x - Q**
with display,
hinged



Mounting diagram **PREM**ASREG® **716x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected,
but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow:
P1 (+) dynamic pressure,
Connected in flow direction
P2 (–) static pressure,
Connected free of dynamic pressure components

(E) Level:
P1 (+) Connection submerged in medium
P2 (–) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

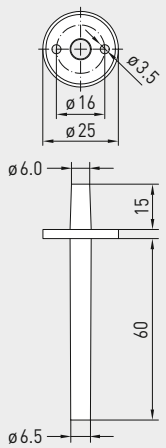
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

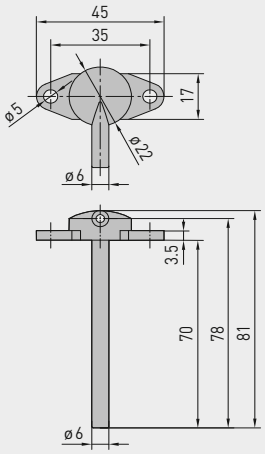
Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, incl. connection set

S+S REGELTECHNIK

Dimensional drawing [mm] **ASD-06**



Dimensional drawing [mm] **ASD-07**



ASD-06
Connection set



ASD-07
Connection nipple





WS-03
Weather and sun protection hood (optional)

Pressure port for pressure hose (as standard)



Pressure port for PVC/fabric pressure hose (optional)



ACCESSORIES

ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	**7,87 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information, see chapter Accessories!		

PREMASREG® **716x-Q**
with M12 connector



PREMASREG® **716x**
with cable gland



PREMASREG® **716x**	Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *Deluxe* (with cable gland or M12 connector)					
Measuring Range Pressure / Volume Flow	**Type / WG02**		**Output**	**Display** ● = **Q**	**Item No.**	**Price**
0...1000 Pa	**Type 7161**					
k = 3000 **94800 m³/h**	PREMASREG 7161-UW	LCD	0-10 V 1x Changeover contact	■	1302-7161-4161-200	**286,49 €**
	PREMASREG 7161-UW **Q**	LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-021	**329,66 €**
0...5000 Pa	**Type 7165**					
k = 3000 **212100 m³/h**	PREMASREG 7165-UW	LCD	0-10 V 1x Changeover contact	■	1302-7161-4171-200	**286,49 €**
	PREMASREG 7165-UW **Q**	LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-031	**329,66 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)					
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.					
Extra charge:	**with optional quick connect** for PVC fabric pressure hose Ø 6 mm					**43,20 €**

S+S REGELTECHNIK

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

The electronic **PREM**ASREG® **761x-VA** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) are fitted with one switching output, one continuous output and a backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

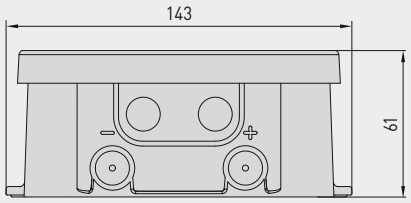
Power supply:	24 V AC / DC (± 10 %) and 15...36 V DC
Load resistance:	R_L > 5 kOhm
Power consumption:	< 1.5 VA / 24 V DC, < 2.8 VA / 24 V AC
Measuring function:	**Volume flow, differential pressure, filter monitoring, fill level** (adjustable)
Measuring ranges:	**10...100%** (adjustable)
Type of pressure:	differential pressure
Pressure port:	with **quick connect** made from stainless steel for PVC / fabric pressure hose Ø 6 mm (external diameter) optionally with **pipe fitting** made from stainless steel V2A (1.4305) for pressure lines Ø 6 mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	–20...+50 °C
Accuracy:	**Type 7161** (1000 Pa): typically ± 5 Pa **Type 7165** (5000 Pa): typically ± 25 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value (pressure)
Temp. drift values:	± 0.1 % / °C
Positive / negative pressure:	max. ± 10000 Pa
Signal hysteresis:	± 1 % of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.14 - 1.5 mm², via plug-in screw terminal
Cable connection:	**cable gland, stainless steel V2A** (1.4305) (M 20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) **or** **M12 connector** (male, **12-pin**, A-code) according to DIN EN 61076-2-101
Housing:	**stainless steel V4A** (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Typ 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Equipment:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), for displaying the **volume flow, differential pressure, contamination degree** or **level** and for setting the **switchpoint, K factor, measuring range limits** and other settings
K factor:	**1 to 3000** (adjustable)
Units:	**m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm** (adjustable)
Max. value displayed:	999999
ACCESSORIES	(see table)

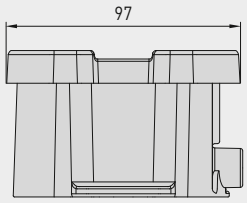
Pressure port for PVC / fabric pressure hose (as standard)



Dimensional drawing
[mm]

PREMASREG® **716x-VA**



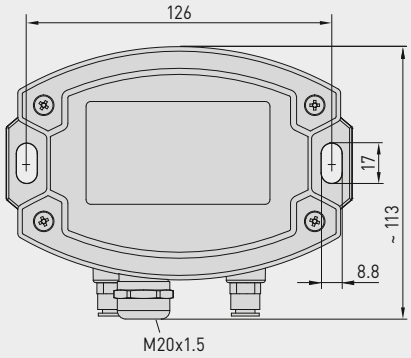


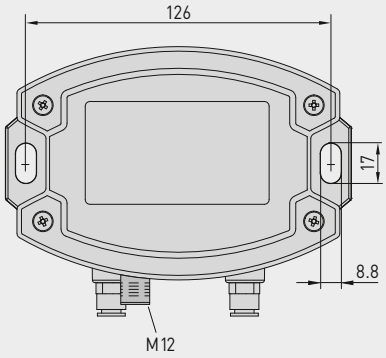
Housing with
cable gland

equipped as standard with
quick connect
for pressure hoses

Housing with
M12 connector

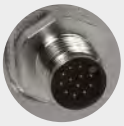
equipped as standard with
quick connect
for pressure hoses







Pressure port for
PVC / fabric pressure hose
(as standard)



M12 connector
(male)

PREMASREG® **716x-VA**
with cable gland
and display



PREMASREG® **716x-VAQ**
with M12 connector
and display





Dimensional drawing
[mm]

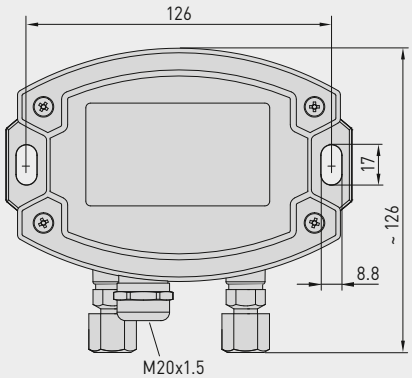
PREMASREG® **716x-VA**

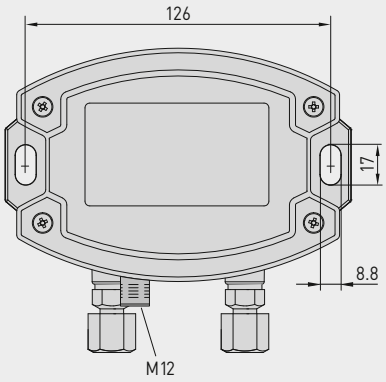
Housing with
cable gland

optional on request
with **pipe fitting**
for pressure lines

Housing with
M12 connector

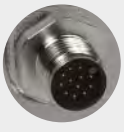
optional on request
with **pipe fitting**
for pressure lines







Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

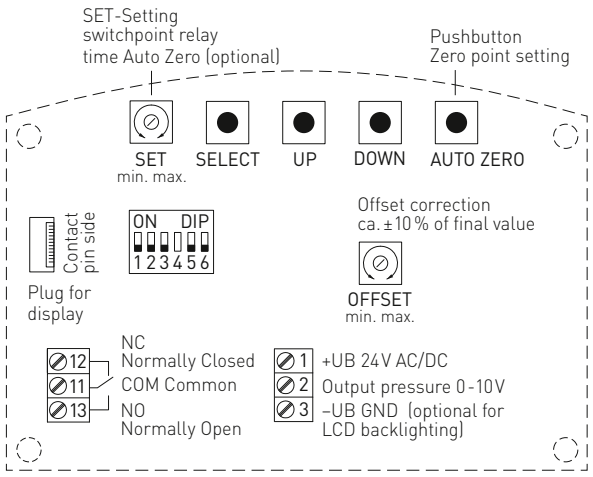
Pressure port
for pressure lines / pipes
(optional)



Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

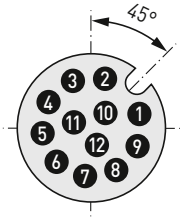
S+S REGELTECHNIK

Schematic diagram — **PREM**ASREG® **716x-UW**



DIP switch 4 is not assigned!

Pin assignment (M12) — **PREM**ASREG® **716x-UW**



1. +UB 24 V AC / 15...36 V DC
2. Output pressure 0-10V
3. free
4. –UB GND
5. free
6. free
7. COM Common
8. NC Normally Closed
9. NO Normally Open
10. free
11. free
12. free

Measuring range mode (Mode selectable)	**DIP 1**
Unidirectional (0...+MR) (default)	OFF
Bidirectional (–MR...+MR)	**ON**

Small value suppression (measured values < 1% of end value (pressure) = 0)	**DIP 2**
Deactivated (default)	OFF
Active	**ON**

Relay (Function adjustable)	**DIP 3**
Deactivated (default)	OFF
Active (display shows switching point)	**ON**

Measurement signal filtering (Time interval selectable)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Service mode (display adjustable)	**DIP 6**
Standard (according to configuration) (default)	OFF
Service (differential pressure in Pa)	**ON**

PREMASREG® **716x**
Function types



Volumolume flow rate

$$V = k \cdot \sqrt{\Delta p}$$

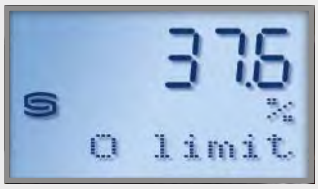
V = Volume flow in m³/h
k = K factor 1...3000
Δp = Differential pressure in Pa



Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa
p_+ = higher pressure
p_- = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %
Δp = Differential pressure in Pa
p_{Filter} = differential pressure filter replacement in Pa



Level display

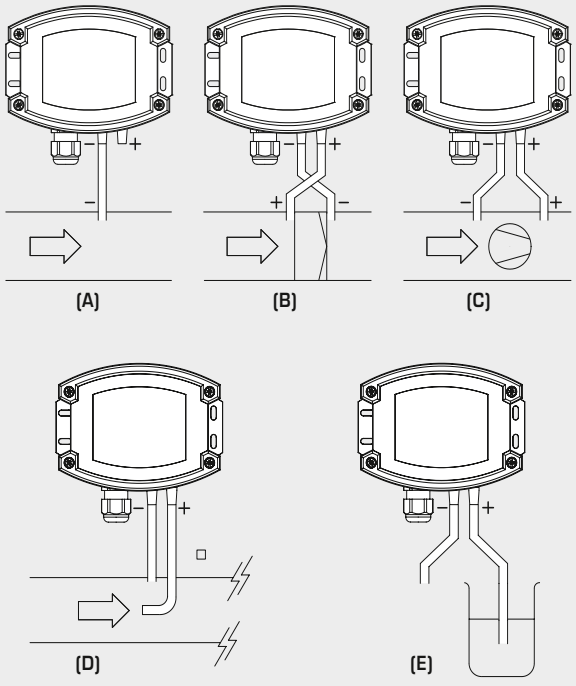
$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm
Δp = Differential pressure in Pa
ρ = Density 700...1300 in kg/m³
g = 9.81 m/s²

PREMASREG® **716x - VAQ**
with display,
hinged



Mounting diagram **PREM**ASREG® **716x**



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected,
but open to the atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

(D) Volume flow:
P1 (+) dynamic pressure,
Connected in flow direction
P2 (–) static pressure,
Connected free of dynamic pressure components

(E) Level:
P1 (+) Connection submerged in medium
P2 (–) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with
P1 (+) for higher pressure and
P2 (–) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection

S+S REGELTECHNIK

PREMASREG® **716x-VAQ**
with M12 connector



PREMASREG® **716x-VAQ**	Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *ID* Stainless steel housing with M12 connector				
Measuring Range Pressure / Volume Flow	**Type / WG02I**	**Output**	**Display ● = Q**	**Item No.**	**Price**
0...1000 Pa	**Type 7161**				
k = 3000 **94800 m³/h**	PREMASREG 7161-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-021	**827,81 €**
0...5000 Pa	**Type 7165**				
k = 3000 **212100 m³/h**	PREMASREG 7165-UW VA**Q** LCD	0-10 V 1x Changeover contact	● ■	2004-6192-4100-031	**827,81 €**
Housing variant "Q":	Cable connection with **M12 connector** (male, **12-pin**, A-code)				
Multi-range switching:	The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:	**with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**43,20 €**

ACCESSORIES	
xx-M12	**Special accessories for M12 connector**
	For further information, see chapter Accessories !

PREMASREG® **716x-VA**
with cable gland



PREMASREG® **716x-VA**		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, *ID* Stainless steel housing with cable gland				
Measuring Range Pressure / Volume Flow		**Type / WG02I**	**Output**	**Display**	**Item No.**	**Price**
0...1000 Pa		**Type 7161**				
k = 3000	**94800 m³ / h**	PREMASREG 7161-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-021	**788,11 €**
0...5000 Pa		**Type 7165**				
k = 3000	**212100 m³ / h**	PREMASREG 7165-UW VA LCD	0-10 V 1x Changeover contact	■	2004-6192-4200-031	**788,11 €**
Housing variant:		Cable connection with **cable gland** made from stainless steel V2A (1.4305)				
Multi-range switching:		The **pressure ranges** depend on the device type and can be set via DIP switches.				
Extra charge:		**with optional pipe fitting** made from stainless steel V2A for pressure lines Ø **6 mm**				**43,20 €**



Pressure port for
PVC / fabric pressure hose
(as standard)



Pressure port for
pressure lines / pipes
(optional)

Barometers /
Measuring transducers for atmospheric pressure, calibratable, with active output

S+S REGELTECHNIK

ALD

Calibratable barometer **PREM**ASGARD® **ALD** with active output (U/I switchable) and 4 measuring ranges (max. 600...1100 hPa, switchable), in a compact plastic housing with quick-locking screws, optionally with/without display.

The pressure sensor is used for measuring atmospheric air pressure in clean air (non-precipitating) or other non-aggressive, non-combustible gases. It is used in various applications such as ventilation and air conditioning technology, in meteorological measurement stations and air-pressure-dependent control systems.

The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.



TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	R_a (Ohm) = 25 ...450 Ohm for I-output
Load resistance:	R_L > 25 kOhm for U-output
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring ranges:	**multi-range switching with** **4 switchable measuring ranges** (see table)
Output:	**switchable 0-10 V / 4...20 mA** (via DIP switches)
Connection type:	3-wire connection
Ambient temperature:	storage –35...+85 °C; operation – 30...+75 °C, non-precipitating
Type of pressure:	atmospheric air pressure / absolute pressure
Medium:	clean air and non-aggressive, non-combustible gases
Accuracy:	typically ± 0.4 kPa compared to calibrated reference device
Zero point offset:	± 50 hPa
Positive pressure:	200 kPa
Signal filtering:	**switchable 1 s / 10 s** (via DIP switches)
Temperature drift:	± 0.1 % of final value per °C
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 plug-in connector** (flush-type connector, 5-pin, A-coding) according to DIN EN 61076-2-101 (optional, available upon request)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Equipment:	**display,** one-line, cutout approx. 36 x 15 mm (W x H), for displaying the atmospheric air pressure / absolute pressure
ACCESSOIRES	see chapter Accessories
WS-04	**weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)

Pressure range (adjustable)	**DIP 1**	**DIP 2**
600...1100 hPa	OFF	OFF
700...1100 hPa	**ON**	OFF
800...1100 hPa	OFF	**ON**
900...1100 hPa (default)	**ON**	**ON**

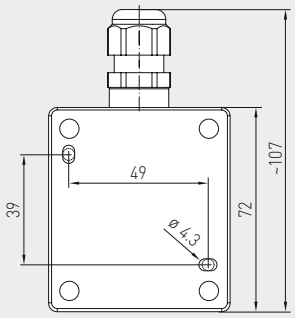
Measurement signal filtering (selectable time interval)	**DIP 5**
10 s (default)	OFF
1 s	**ON**

Output (selectable)	**DIP 6**
Voltage 0-10 V (default)	OFF
Current 4... 20 mA	**ON**

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

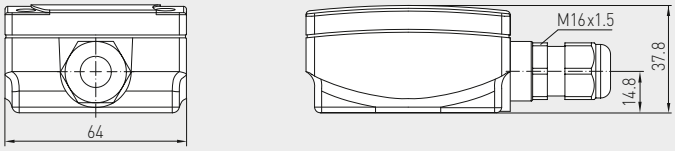
Dimensional drawing **ALD**



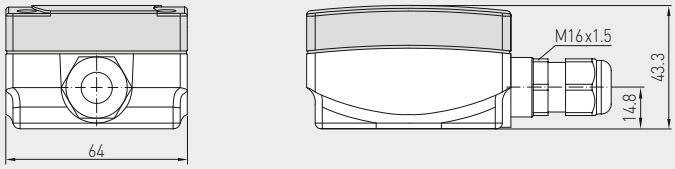


M12 connector
(optional on request)

without display



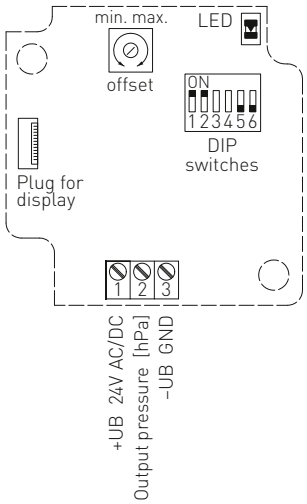
with display



ALD
with display



Schematic diagram **PREMASGARD® ALD**



Status LED (DIP 6)
I Output (ON) = orange
U Output (OFF) = green

Offset correction

Plug for display
contact is
on the right side

DIP switches 3 and 4 are not assigned!

WS-04
Weather and sun protection hood
(optional)



PREMASGARD® ALD Measuring transducer for atmospheric pressure

Pressure range (adjustable)	Type / WG01	Output (switchable)	Display	Item no.	Price
max. 600...1100 hPa	**ALD**				
600...1100 hPa 700...1100 hPa 800...1100 hPa 900...1100 hPa	ALD	0-10 V / 4...20 mA		1301-1157-0130-200	**172,75 €**
	ALD LCD	0-10 V / 4...20 mA	■	1301-1157-2130-200	**203,72 €**
Multi-range switching:	The **pressure ranges** can be set via DIP switches.				
Output:	**0-10 V or 4...20 mA** (selectable via DIP switches)				
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				

S+S REGELTECHNIK

Differential pressure switches for air, with mounting angle, incl. connection set

The mechanical differential pressure switch / differential pressure monitor **PREM**ASREG® **DS 1** with metal angle is used for monitoring above-atmospheric, differential, and below-atmospheric pressures of air and gaseous, non-aggressive media in air ducts, ventilation intake or exhaust devices, as a flow monitor, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 1 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting angle **DS-MW-Z**.

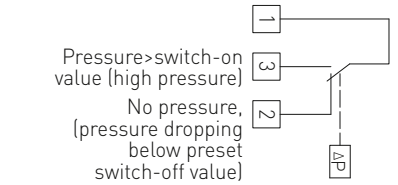
DS 1
with mounting angle



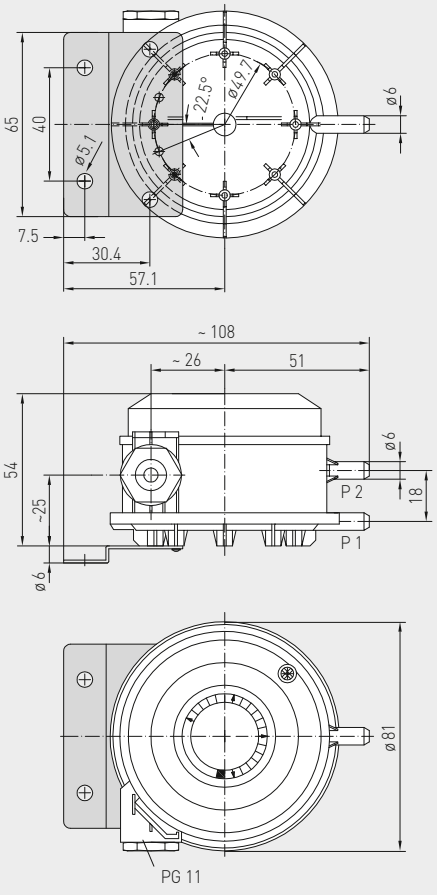
TECHNICAL DATA

Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10 % GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	–30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90 % RH, non-precipitating air
Electrical connection:	0.14 - 1.5 mm², via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	**with metal angle DS-MW-Z** (included in the scope of delivery) (for other optional shapes, see table) Recommended mounting position: vertical (pressure connections downward) – factory setting; horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918
FUNCTION	Contact 1 - 2 breaks when pressure / differential pressure rises to the preset value. Contact 1 - 3 closes when pressure / differential pressure drops and can be used as signal contact.
ACCESSORIES	
ASD-06	**Connection set** (nipple straight) – (included in the scope of delivery)
DS-MW-Z	**Mounting angle** (included in the scope of delivery)
DS-MW-L	**Mounting angle** (optional)
DS1-MW-U	**Mounting angle** (optional), combination bracket for vertical or horizontal mounting
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, aus stainless steel **V2A** (1.4301)

Dimensional drawing **DS 1**



Dimensional drawing **DS 1**
with mounting angle
DS-MW-Z



Differential pressure switches for air, with mounting ring, including connection set

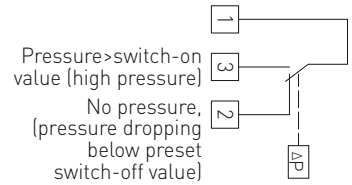
The mechanical differential pressure switch / differential pressure monitor **PREM**ASREG® **DS-2** with 4-hole plastic base ring is used for monitoring above-atmospheric, differential and below-atmospheric pressures of clean air and other gaseous, non-aggressive non-combustible media in air ducts, air intake or exhaust devices, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 2 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting ring **DS-MR-K**.

DS 2
with mounting ring



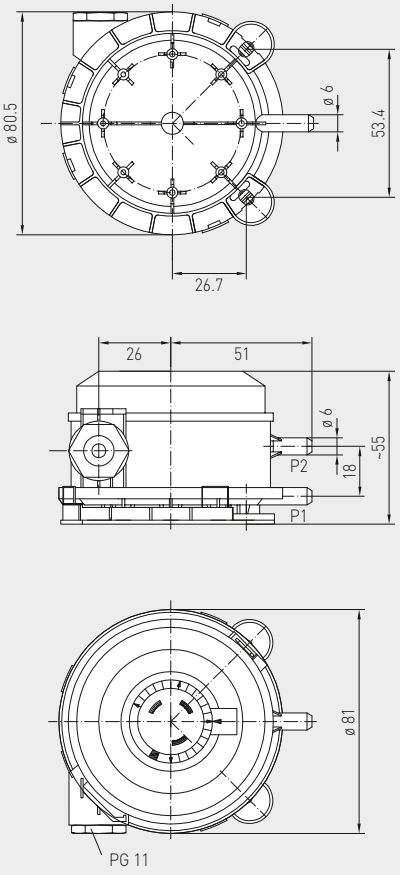
Schematic diagram **DS 2**



TECHNICAL DATA

Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10 % GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	–30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90 % RH, non-precipitating air
Electrical connection:	0.14 - 1.5 mm², via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	**by 4-hole base ring, plastic** (included in the scope of delivery), recommended mounting position: vertical (pressure connections downward) – factory setting, horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	**IP 54** (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918
FUNCTION	Contact 1 - 2 breaks when pressure / differential pressure rises to the preset value. Contact 1 - 3 closes when pressure / differential pressure drops and can be used as signal contact.
ACCESSORIES	
ASD-06	**Connection set** (nipple straight) – (included in the scope of delivery)
DS-MR-K	**Mounting ring** (included in the scope of delivery)
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, aus stainless steel **V2A** (1.4301)

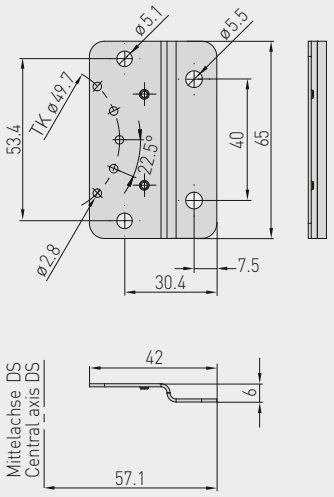
Dimensional drawing **DS 2**
with mounting ring
DS-MR-K



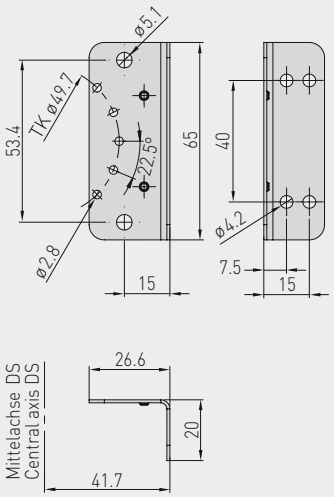
Differential pressure switches for air, including connection set

S+S REGELTECHNIK

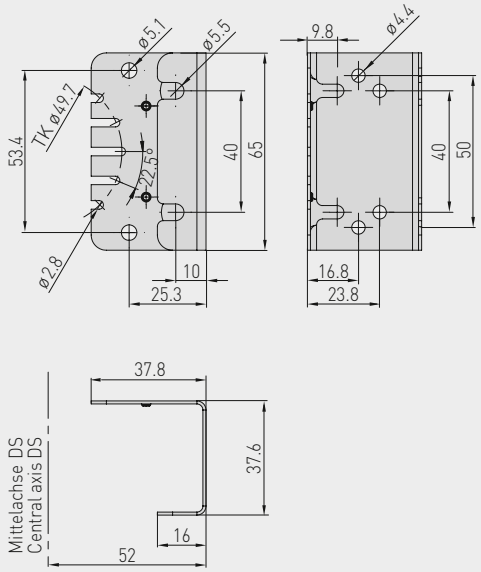
Dimensional drawing **DS - MW-Z**
Mounting angle



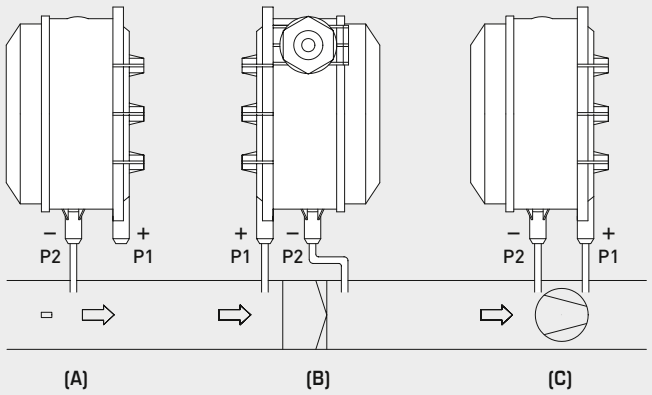
Dimensional drawing **DS - MW-L**
Mounting angle



Dimensional drawing **DS - MW-U**
Mounting angle



Mounting diagram **DS 1 / DS 2**



DS 1 / DS 2
Connection



TYPES OF MONITORING:

(A) Below-atmospheric pressure:
P1 (+) is not connected but open against atmosphere
P2 (–) connected to inside of duct

(B) Filter:
P1 (+) connected upstream of filter
P2 (–) connected downstream of filter

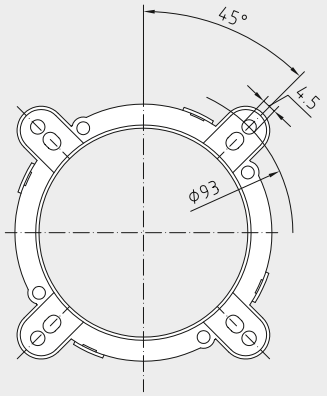
(C) Ventilator:
P1 (+) connected downstream of ventilator
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (–) for lower pressure.

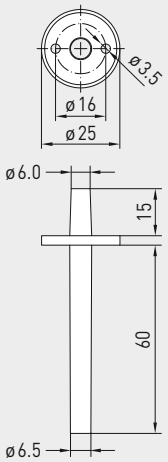
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

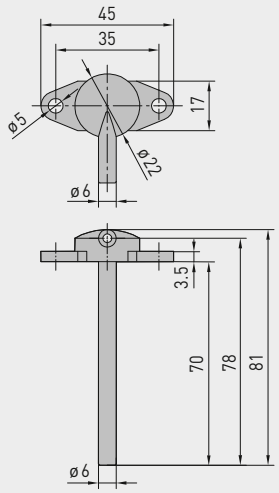
Dimensional drawing **DS-MR-K** Mounting ring



Dimensional drawing **ASD-06** Connection set



Dimensional drawing **ASD-07** Connection nipple



WS-04
Weather and sun protection hood (optional)



ASD-06
Connection set



ASD-07
Connection nipple



PREMASREG® DS 1 Differential pressure switches with mounting angle, *Premium*
PREMASREG® DS 2 Differential pressure switches with mounting ring, *Standard*

Type	Pressure range (adjustable)		Operating Difference approx.	Max. Pressure	Item No.	Price
DS 1 / WG02	*Premium*				**with mounting angle DS-MW-Z**	
DS-106	20… 300 Pa	(0.2…3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4011-0000-000	**54,80 €**
DS-106 A	50… 500 Pa	(0.5…5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4012-0000-000	**54,80 €**
DS-106 B	100…1000 Pa	(1.0…10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4013-0000-000	**54,80 €**
DS-106 C	500…2000 Pa	(5.0…20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4014-0000-000	**54,80 €**
DS-106 D	1000…5000 Pa	(10.0…50.0 mbar)	2.5 mbar ± 15 %	7500 Pa (75 mbar)	1302-4015-0000-000	**54,80 €**
DS 2 / WG03B	*Standard*				**with mounting ring DS-MR-K**	
DS-205 F	20… 300 Pa	(0.2…3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4026-0000-000	**36,16 €**
DS-205 B	50… 500 Pa	(0.5…5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4022-0000-000	**36,16 €**
DS-205 D	100…1000 Pa	(1.0…10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4027-0000-000	**36,16 €**
DS-205 E	500…2000 Pa	(5.0…20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4028-0000-000	**36,16 €**
ACCESSORIES						
DS-MW-Z	Sheet steel **mounting angle** in **Z**-form **(DS 1: included in the scope of delivery)**				7100-0063-0000-000	**13,76 €**
DS-MW-L	Sheet steel **mounting angle** in **L**-form				7100-0063-1000-000	**14,08 €**
DS-MW-U	Sheet steel **mounting angle** in **U**-form				7100-0060-9000-000	**17,31 €**
ASD-06	**Connection set (included in the scope of delivery),** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws				7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of plastic, ABS				7100-0060-7000-000	**7,87 €**
WS-04	**Weather and sun protection hood**, 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)				7100-0040-7000-000	**38,61 €**
	For further information, see last chapter Accessories!					

PREMASGARD® SHD-SD
PREMASGARD® SHD

Pressure measuring transducers, incl. DIN plug-in connectors, with active output

S+S REGELTECHNIK

The pressure sensor **PREM**ASGARD® **SHD-SD** is used for measuring relative pressures (min. 0...6 bar / max. 0...16 bar) in gaseous and liquid media. **Not suitable for ammonia and freon!**

The pressure sensor **PREM**ASGARD® **SHD** is used for measuring relative pressures (min. 0...1 bar / max. 0...40 bar) in gaseous and liquid media. The pressure measuring cell is welded to the pressure sensors without a gasket.

The pressure measuring transducer converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. Process connection is G ½". This pressure transmitter is used in hydraulics, pneumatics, process technology, in mechanical and plant engineering.

SHD xx
with display

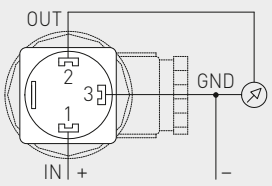


TECHNICAL DATA

Power supply:	24 V AC / DC for output 0-10 V 7 - 33 V DC for output 4...20 mA
Measuring ranges:	see table (other ranges upon request)
Output:	0-10 V, 3-wire, (working resistance > 10 kOhm) or 4... 20 mA, 2-wire, (working resistance < (UB (V) -7 V) / 0,02 A; R_L depending on working resistance
Electrical connection:	0.25 - 1.5 mm², via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G ½" sealing at the back
Type of pressure:	relative
Medium:	liquid and gaseous
Response time:	2 ms (1 ms typical)
Characteristic line:	± 0.3 %
Mounting:	directly on pressure line
Housing:	stainless steel **V2A** (1.4305)
Connecting head:	plastic, approx. 98 x 50 x 34 mm
SHD-SD	
Measuring principle:	**ceramic measuring cell**
Temperature of medium:	–15...+ 125 °C
Medium contacting parts:	stainless steel **V2A** (1.4305); measuring element ceramic Al_2O_3 (96%); sealing material FPM (Viton)
Load changes:	< 100 Hz
Overload range / Bursting pressure:	< 4 bar: 3 x FS > 4 bar: 2.5 x FS
SHD	
Measuring principle:	**steel measuring cell**
Temperature of medium:	–40...+135 °C
Medium contacting parts:	stainless steel **V2A** (1.4305)
Overload range:	< 6 bar: 5 x of final valu > 6 bar: 3 x of final valu (max. 1500 bar)
Bursting pressure:	< 6 bar: 10 x of final valu > 6 bar: 6 x of final valu (max. 2500 bar)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Tests:	Drinking water approval according to NSF/ANSI 61/372, UL-certified according to ANSI/UL 61010-1
Optional:	with **display module,** made of plastic, polyamide material, black colour, LCD display rotatable and tiltable, for displaying the pressure (in bar, other units available upon request)

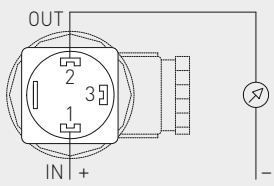
Connecting diagram **SHD xx-U**

2 Output pressure 0-10 V
3 GND
1 Supply voltage UB+ 24V AC/DC



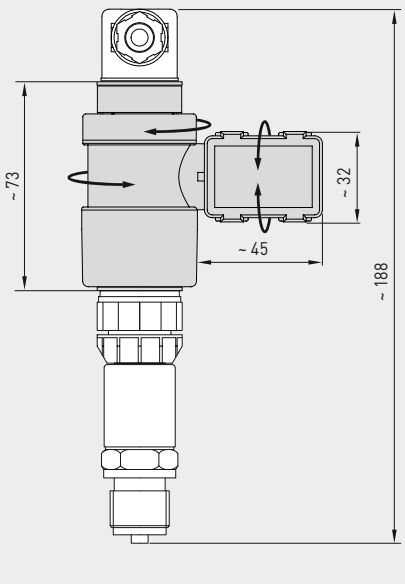
Connecting diagram **SHD xx-I**

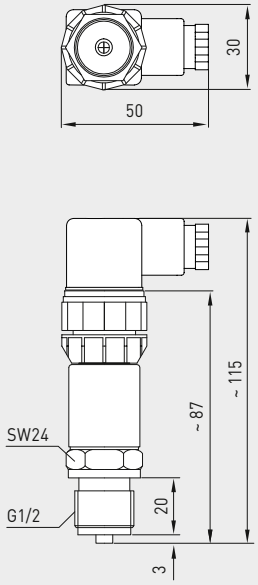
2 Output pressure 4...20 mA
3 Free
1 Supply voltage UB+ 24V DC



Dimensional drawing
[mm]

SHD xx





SHD xx
without display



PREMASGARD® **SHD-SD**	Pressure measuring transducer, *Standard* for gaseous and liquid media				
Measuring Range	**Type / WG01**	**Display**	**Item No.** Output 0-10 V	**Item No.** Output 4...20 mA	**Price**
	SHD-SD-x = U / I		U-variant	I-variant	
0... **6 bar**	SHD-SD-**x** 6		1301-2121-0550-120	1301-2122-0550-000	**133,75 €**
	SHD-SD-**x** 6 LCD	■	1301-2121-1550-120	1301-2122-1550-000	**417,12 €**
0... **10 bar**	SHD-SD-**x** 10		1301-2121-0560-120	1301-2122-0560-000	**133,75 €**
	SHD-SD-**x** 10 LCD	■	1301-2121-1560-120	1301-2122-1560-000	**417,12 €**
0... **16 bar**	SHD-SD-**x** 16		1301-2121-0570-120	1301-2122-0570-000	**133,75 €**
	SHD-SD-**x** 16 LCD	■	1301-2121-1570-120	1301-2122-1570-000	**417,12 €**
Note:	**Not suitable for ammonia and freon!**				

PREMASGARD® **SHD**	Pressure measuring transducer, *Premium* for gaseous and liquid media				
Measuring Range	**Type / WG01**	**Display**	**Item No.** Output 0-10 V	**Item No.** Output 4...20 mA	**Price**
	SHD-x = U / I		U-variant	I-variant	
0... **1 bar**	SHD-**x** 1		1301-2111-0520-220	1301-2112-0520-120	**220,94 €**
	SHD-**x** 1 LCD	■	1301-2111-1520-220	1301-2112-1520-120	**504,32 €**
0...**2,5 bar**	SHD-**x** 2,5		1301-2111-0530-220	1301-2112-0530-120	**220,94 €**
	SHD-**x** 2,5 LCD	■	1301-2111-1530-220	1301-2112-1530-120	**504,32 €**
0... **6 bar**	SHD-**x** 6		1301-2111-0550-220	1301-2112-0550-120	**159,97 €**
	SHD-**x** 6 LCD	■	1301-2111-1550-220	1301-2112-1550-120	**443,34 €**
0... **10 bar**	SHD-**x** 10		1301-2111-0560-220	1301-2112-0560-120	**159,97 €**
	SHD-**x** 10 LCD	■	1301-2111-1560-220	1301-2112-1560-120	**443,34 €**
0... **16 bar**	SHD-**x** 16		1301-2111-0570-220	1301-2112-0570-120	**159,97 €**
	SHD-**x** 16 LCD	■	1301-2111-1570-220	1301-2112-1570-120	**443,34 €**
0... **25 bar**	SHD-**x** 25		1301-2111-0580-220	1301-2112-0580-120	**220,94 €**
	SHD-**x** 25 LCD	■	1301-2111-1580-220	1301-2112-1580-120	**504,32 €**
0... **40 bar**	SHD-**x** 40		1301-2111-0590-220	1301-2112-0590-120	**220,94 €**
	SHD-**x** 40 LCD	■	1301-2111-1590-220	1301-2112-1590-120	**504,32 €**

PREMASGARD® SHD 692

**Pressure measuring transducers,
incl. DIN plug-in connectors and mounting angle,
with active output**

S+S REGELTECHNIK

The pressure sensor / differential pressure sensor **PREM**ASGARD® **SHD-692** is used for pressure measurement in gaseous and liquid media. It converts the measurand into standard signals of 0-10 V or 4...20 mA. Process connection is 2 x G⅛" - 27 NPT internal thread. SHD-692 differential pressure transmitters are used in piping and hydraulic systems, in mechanical and plant engineering as well as in building automation.
Not applicable for ammonia and Freon!

SHD 692
with display

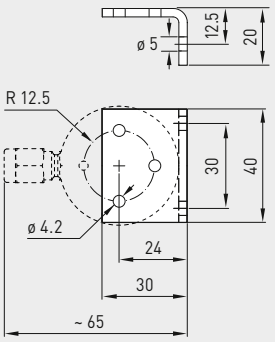


TECHNICAL DATA

Power supply:	24 V AC (+15 % / –10 %), 18 - 33 V DC for U-variant 24 V DC (± 20 %) for I-variant
Measuring ranges:	see table
Output:	0-10 V (3-wire connection) or 4...20 mA (2-wire connection)
Permissible working resistance: (at nominal voltage)	R_L > 10 kΩ for U-variant R_L < 600 Ω for I-variant
Electrical connection:	0.25 - 1.5 mm², via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	screw pipe connection for 6 mm pipe (G⅛" - 27 NPT internal thread)
Type of pressure:	differential pressure
Measuring principle:	**ceramic measuring cell**
Medium:	liquid or gaseous
Temperature of medium:	–15...+80 °C
Housing:	stainless steel **V2A** (1.4305)
Mounting:	by mounting angle (included in the scope of delivery), installation arbitrary
Medium contacting parts:	INOX (1.4305), ceramics, sealing material EPDM
Response time:	< 5 ms
Class:	0.5 %
Total error:	< 1.3 %
Overload range:	see table (one-sided max. pressure)
System pressure:	max. 25 bar (P1 + P2)
Bursting pressure:	1.5 x system pressure
Insulating resistance:	≥ 100 MOhm, at +20 °C (500 V DC)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU
Optional:	with **display module,** made of plastic, polyamide material, black colour, LCD display rotatable and tiltable, for displaying the pressure (in bar, other units available upon request)

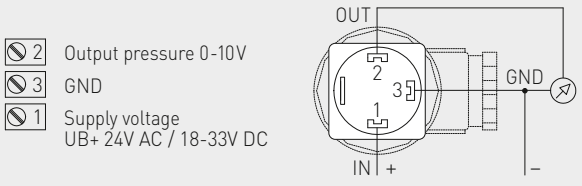
Dimensional drawing [mm]

SHD 692
Mounting angle



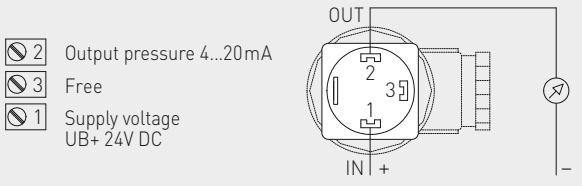
Connecting diagram

SHD 692-U



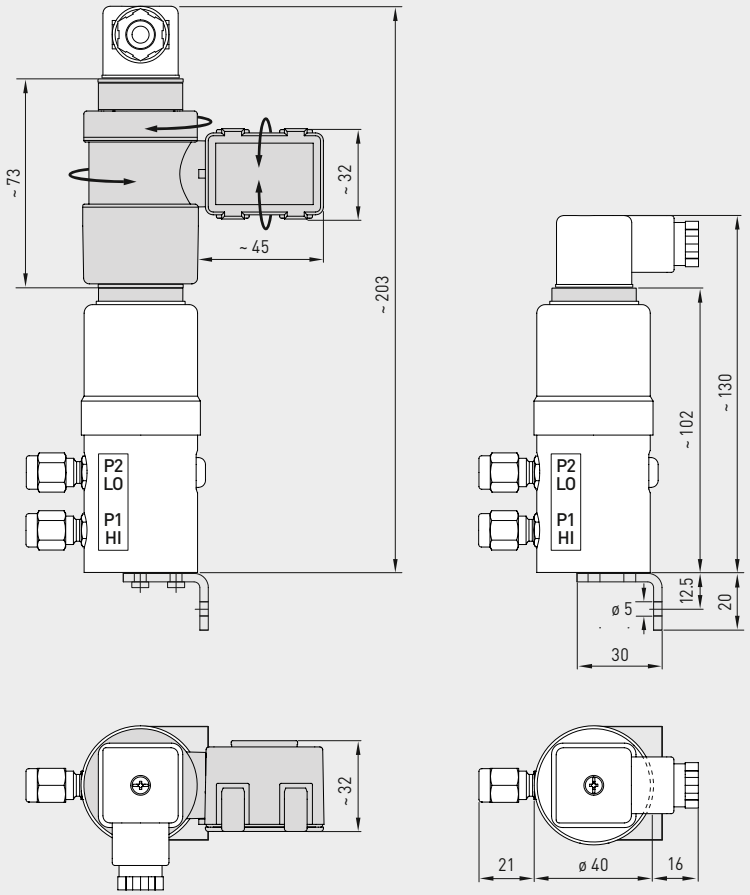
Connecting diagram

SHD 692-I



Dimensional drawing
[mm]

SHD 692



SHD 692
without display



PREMASGARD® **SHD 692**		Pressure measuring transducers, *Deluxe* or gaseous and liquid media				
Measuring Range	**One-Sideed max. pressure**	**Typd / WG02**	**Display**	**Item No.** Output 0-10 V	**Item No.** Output 4...20 mA	**Price**
		SHD 692-x = U / I		U-variant	I-variant	
0...**0,1 bar**	0,6 bar	SHD 692-**x**-900		1301-4121-0500-000	1301-4122-0500-000	**363,38 €**
		SHD 692-**x**-900-LCD	■	1301-4121-1500-000	1301-4122-1500-000	**646,76 €**
0...**0,5 bar**	3 bar	SHD 692-**x**-907		1301-4121-0510-000	1301-4122-0510-000	**363,38 €**
		SHD 692-**x**-907-LCD	■	1301-4121-1510-000	1301-4122-1510-000	**646,76 €**
0... **1 bar**	5 bar	SHD 692-**x**-912		1301-4121-0520-000	1301-4122-0520-000	**363,38 €**
		SHD 692-**x**-912-LCD	■	1301-4121-1520-000	1301-4122-1520-000	**646,76 €**
0...**2,5 bar**	12 bar	SHD 692-**x**-916		1301-4121-0530-000	1301-4122-0530-000	**363,38 €**
		SHD 692-**x**-916-LCD	■	1301-4121-1530-000	1301-4122-1530-000	**646,76 €**
0... **4 bar**	12 bar	SHD 692-**x**-918		1301-4121-0540-000	1301-4122-0540-000	**363,38 €**
		SHD 692-**x**-918-LCD	■	1301-4121-1540-000	1301-4122-1540-000	**646,76 €**
0... **6 bar**	12 bar	SHD 692-**x**-919		1301-4121-0550-000	1301-4122-0550-000	**363,38 €**
		SHD 692-**x**-919-LCD	■	1301-4121-1550-000	1301-4122-1550-000	**646,76 €**
0... **10 bar**	20 bar	SHD 692-**x**-930		1301-4121-0560-000	1301-4122-0560-000	**363,38 €**
		SHD 692-**x**-930-LCD	■	1301-4121-1560-000	1301-4122-1560-000	**646,76 €**
Note:		**Not suitable for ammonia and freon!**				

Light Intensity & Motion

PHOTASGARD® & **KIN**ASGARD®
Light and shade under control

Our light intensity sensors and motion sensors or presence detectors are the obvious choice when it comes to energy saving and security.

They keep the costs for lighting, shading, heating and cooling within the green range. By the way – our solutions are also ideally suited for presence detection in security zones.

Application Areas

- Heating, ventilation, air conditioning and lighting systems
- Greenhouses, shading and solar protection
- Production facilities and offices in line with occupational health and safety regulations
- Access control, protected areas and security zones
- Parking lots, courtyards and corridors



S+S REGELTECHNIK







PHOTASGARD® & **KIN**ASGARD®
LIGHT INTENSITY AND MOTION SENSORS

Light intensity sensors

AHKF	Outdoor light intensity sensor	**553**
FSHKM	in-wall light intensity sensor	**551**
RHKF	Room light intensity sensor	**552**
DHKF	In-ceiling light intensity sensor	**555**

Motion sensors

ABWF	Outdoor motion sensor	**559**
FSBWF-W	In-wall motion sensor with changeover contact	**557**
RBWF	Room motion sensor	**558**
DBWF	In-ceiling motion sensor	**561**
DBWF-C	In-ceiling motion sensor	**561**

Light intensity and motion sensors

ABWF/LF	Outdoor motion and light sensor	**565**
RBWF/LF	Room motion and light sensor	**563**
DBWF/LF/FTF	In-ceiling motion and light sensor with humidity and temperature sensor	**567**







Light Intensity & Motion

PHOTASGARD® & **KIN**ASGARD®
Sensor technology for twilight and presence

Broad Spectrum

Our active motion and light intensity sensors are designed to be multi-functional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

The devices are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Tested safety and certified quality

RoHS conforming materials

ESD compliant manufacturing

CE conformity

UKCA conformity (UK Conformity Assessed)

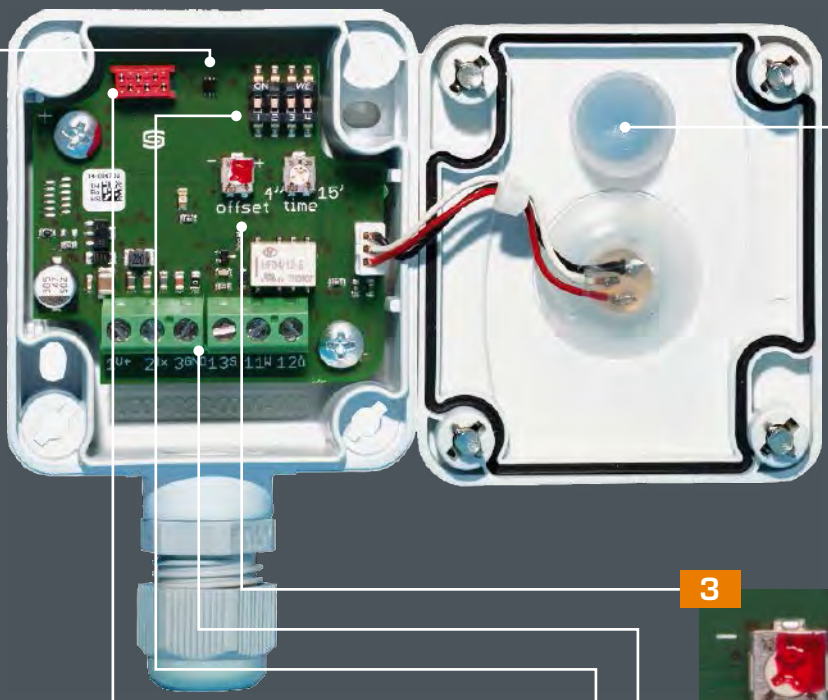
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

EAC certified

GOST certified

PROUDLY
MADE IN
GERMANY

S+S REGELTECHNIK



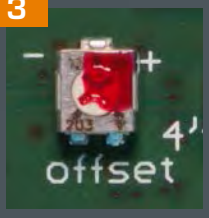
2



Diffusor

With diffusion and absorption rates specially matched to the light intensity sensor, extends the receiving characteristics over a wider angular range

3



Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration

4



Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output

1



Digital Photo Sensor

With high resolution and resistance to ageing,
for a wide linear brightness range of 0-120 kLux

- Special measuring ranges possible, e.g. for twilight
- High measuring accuracy with max. < 5 % deviation

5



DIP Switches

For multi-range toggling and setting of 4 measuring ranges:

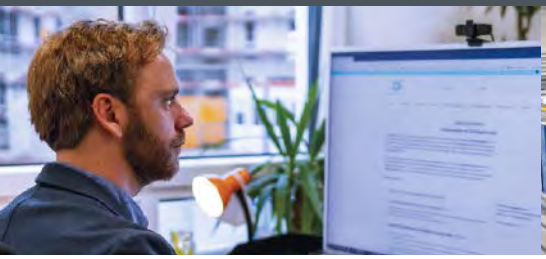
RHKF 0.5 / 1 / 2 / 20 kLux
AHKF 0.5 / 1 / 20 / 60 kLux

6



Quality Assurance

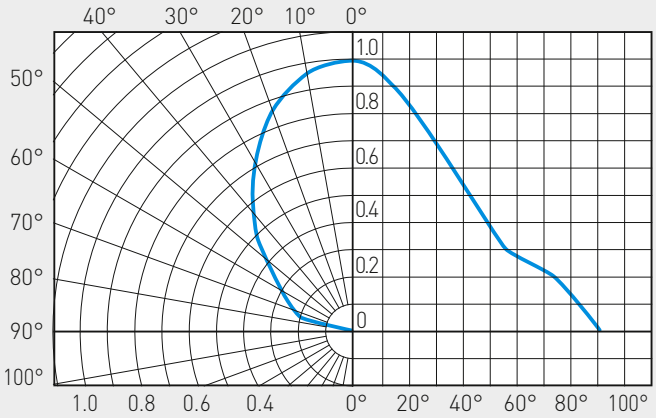
Calibration and balancing are done by means of the bus system





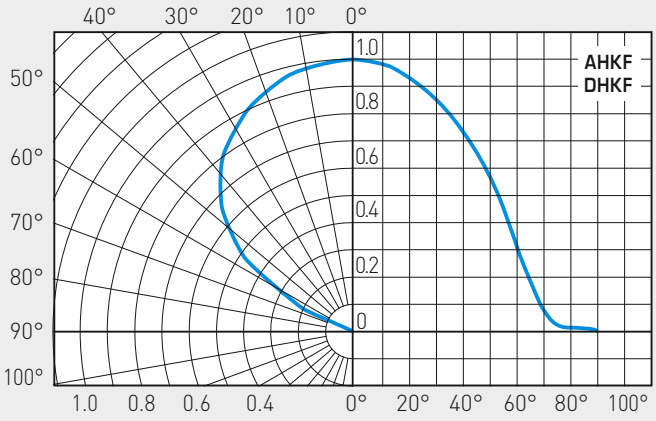


Light sensor (indoor areas) **PHOT**ASGARD®



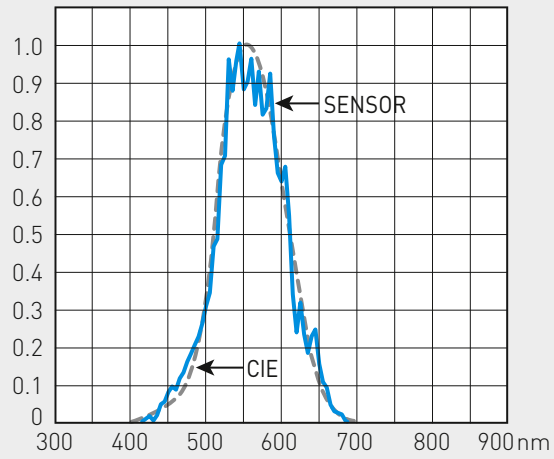
Characteristic curve showing the sensitivity of light sensor (indoor areas) relative to the angle of incidence of light.

Light sensor (outdoor areas) **PHOT**ASGARD®



Characteristic curve showing the sensitivity of light sensor (outdoor areas) relative to the angle of incidence of light.

Light sensor (indoor and outdoor areas) **PHOT**ASGARD®



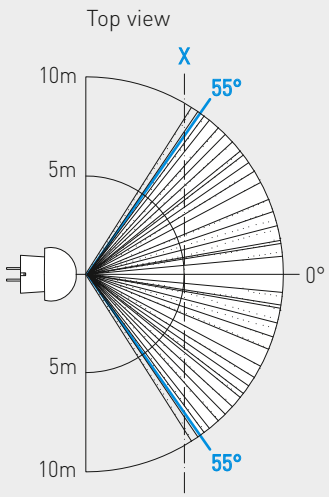
Characteristic curve showing the sensitivity of light sensor on the circuit board in respect of the wavelength of light.

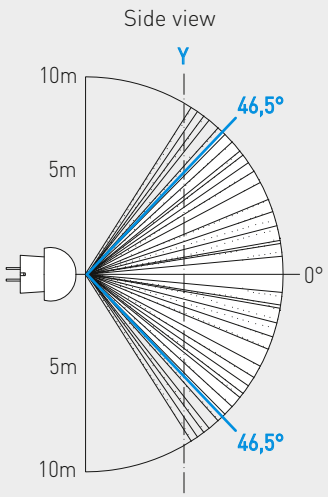
The broken line represents the light perception of the human eye.

The light sensor used in **PHOT**ASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm.

With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

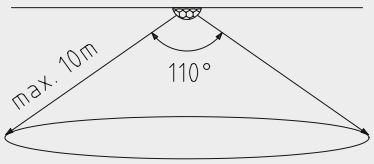
Aperture angle **KIN**ASGARD®



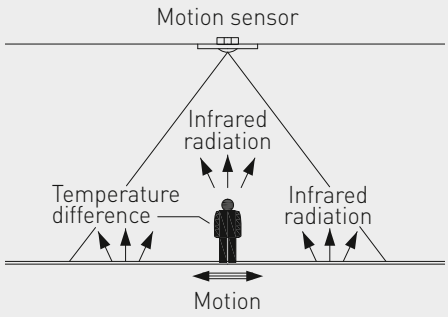


High-end variant infra-red sensor with enlarged aperture angle of 100° or 110° over 360 degrees circumference and 10 m of reach.

Detection range **KIN**ASGARD®



Principle **KIN**ASGARD®



Sensor recognizes the temperature difference resulting from the movement of persons or objects.

In all **KIN**ASGARD® motion sensors and presence detectors, a high-end variant infra-red sensor with enlarged angle of aperture is exclusively used.

The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

The sensor recognizes changes in the infra-red radiation spectrum, meaning heat radiation, resulting from the movement of persons or objects.
Such movements generate a temporary change of the temperature gradient in the field.

Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be > 5 K.

PHOTASGARD® FSHKM

**Room light intensity sensor and measuring transducer,
in-wall in the panel switch programme,
with active output**

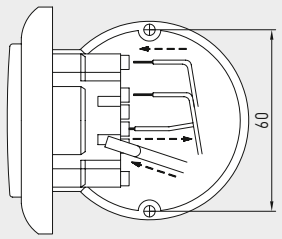
S+S REGELTECHNIK

Maintenance-free light intensity sensor **PHOT**ASGARD® **FSHKM** with active output, in in-wall housing, to determine the illuminance (0…1kLux). The measuring transducer converts the measured variables into a standard signal of 0-10 V. The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

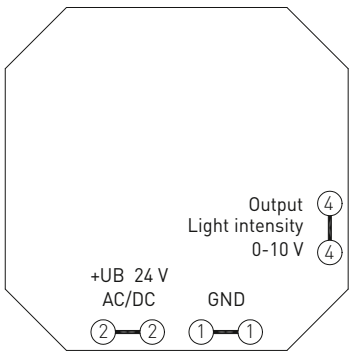
The sensor is used to control luminaires, lighting systems, Venetian blinds and canvas blinds and for monitoring the lighting conditions. It is used indoors at workplaces, in corridors, offices, residential and business premises as well as industrial and storage halls as daylight-dependent constant light control, as brightness or twilight sensor and to control sun protection hoods to avoid unnecessary room heating.

The **light sensor** (**photodiode**) was specifically adapted to the sensitivity of the human eye. It is most sensitive in the range of 350 nm to 820 nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

Mounting diagram [mm] **In-wall**



Schematic diagram **FSHKM-U**

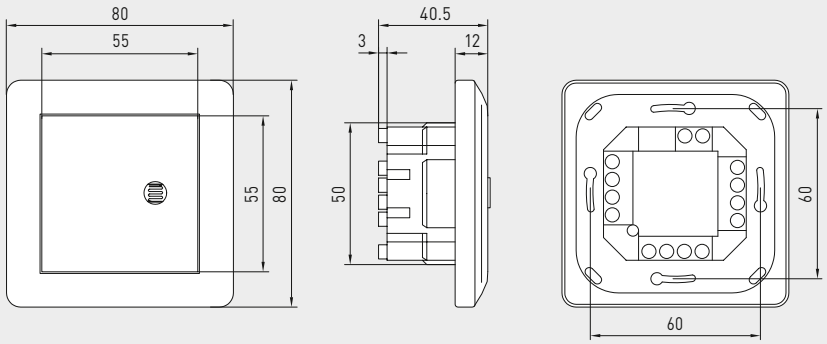


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC
BRIGHTNESS	
Sensor:	Light sensor (photo diode) (see beginning of this chapter)
Measuring range:	0…1 kLux (optionally other individual measuring ranges, e. g. 100 kLux)
Measuring accuracy:	typically ± 10 % final value
Output:	0 - 10 V (linearised)
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage –20…+50 °C; Operation 0…+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Dimensional drawing
[mm]

FSHKM



FSHKM



Light Intensity table
MB: 0...1000 lux

Light [lux]	U_A [V]
0	0.0
50	0.5
100	1.0
150	1.5
200	2.0
250	2.5
300	3.0
350	3.5
400	4.0
450	4.5
500	5.0
550	5.5
600	6.0
650	6.5
700	7.0
750	7.5
800	8.0
850	8.5
900	9.0
950	9.5
1000	10.0

PHOTASGARD® FSHKM	Room light intensity sensor or measuring transducer, in-wall			
Type / WG02	**Measuring range** Light Intensity	**Output** Light Intensity	**Item No.**	**Price**
FSHKM				
FSHKM-U 1K	0...1 kLux	0-10 V	1601-5121-7000-162	**253,07 €**
Extra charge:	optionally other individual measuring ranges, e. g. 100 kLux		on request	

Room light intensity sensors with multi-range switching and active output

S+S REGELTECHNIK

The room light intensity sensor **PHOT**ASGARD® **RHKF** with four switchable measuring ranges (four devices in one) measures the luminous intensity with a diffuser and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in storage halls, workshops and corridors, in indoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used in PHOTASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

RHKF



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor with diffuser (see beginning of this chapter)
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 5 kLux / 20 kLux** (other individual ranges optional, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Deviation:	typically < 5 % of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	**DIP 1**	**DIP 2**	**DIP 3**	**DIP 4**
0...500 Lux	**ON**	OFF	OFF	OFF
0... **1 kLux** (default)	OFF	**ON**	OFF	OFF
0... 5 kLux	OFF	OFF	**ON**	OFF
0... 20 kLux	OFF	OFF	OFF	**ON**

Connecting diagram **RHKF-U**



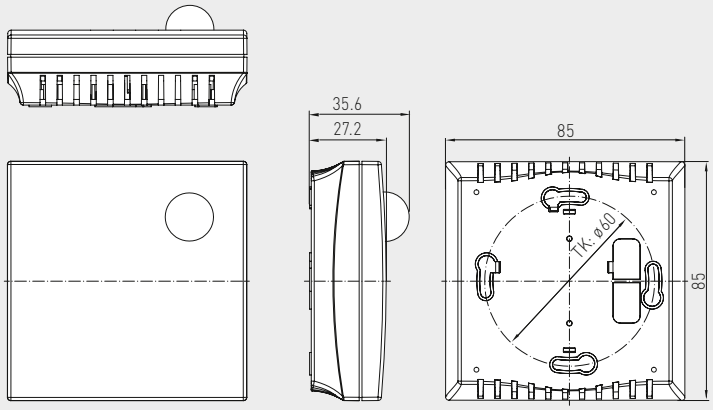
UB+ supply voltage 24V AC/DC
Output light intensity 0-10V
UB– GND

Connecting diagram **RHKF-I**

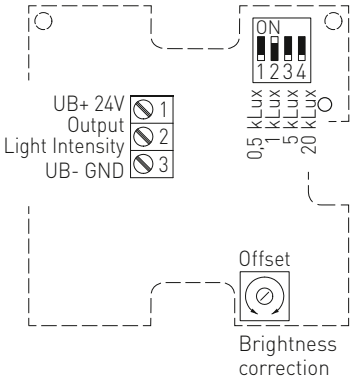


UB+ supply voltage 24V DC
Output light intensity 4...20mA

Dimensional drawing — Housing **Baldur 1** **RHKF**



Schematic diagram **RHKF**



PHOTASGARD® RHKF Room light intensity sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
RHKF				
RHKF-I	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4 ... 20 mA	1601-41A2-2000-000	**103,80 €**
RHKF-U	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0-10 V	1601-41A1-2000-000	**103,80 €**
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

The light intensity sensor / twilight sensor **PHOT**ASGARD® **AHKF** with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at work-places, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and as sun protection control to avoid unnecessary room heating. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and / or for measuring artificial light of high colour temperature (similar to sunlight).

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor (see beginning of this chapter)
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (other individual ranges optional, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Deviation:	typically < 5 % of final value
Ambient temperature:	–30...+70 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), Housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, nner diameter 10.4 mm) **or** **M12 connector** (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	**IP 67** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

AHKF



Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	–
0... 1 kLux	**ON**	OFF	OFF	–
0... 2 kLux	OFF	**ON**	OFF	–
0... 5 kLux	**ON**	**ON**	OFF	–
0... **20 kLux** (default)	OFF	OFF	**ON**	–
0... 60 kLux	**ON**	OFF	**ON**	–

Connecting diagram **AHKF-U**



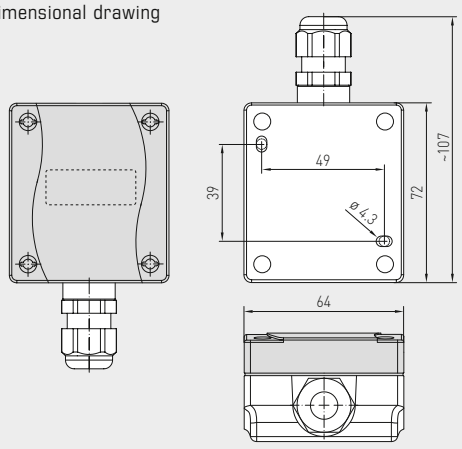
UB+ supply voltage 24V AC/DC
Output light intensity 0-10V
UB– GND

Connecting diagram **AHKF-I**



UB+ supply voltage 24V DC
Output light intensity 4...20mA

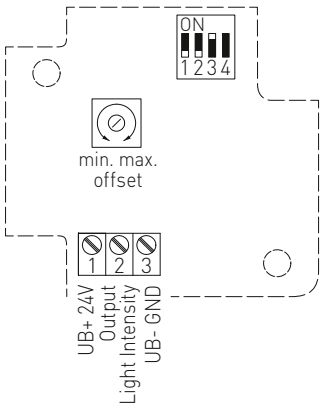
Dimensional drawing **AHKF**





M12 connector
(optional on request)

Schematic diagram **AHKF**



PHOTASGARD® AHKF Outdoor light intensity sensors / twilight sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
AHKF				
AHKF-I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20 mA	1601-1112-1000-000	**103,80 €**
AHKF-U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-1111-1000-000	**103,80 €**
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

In-ceiling light intensity sensors, with multi-range switching and active output

S+S REGELTECHNIK

The light-intensity sensor **PHOT**ASGARD® **DHKF** with six switchable measuring ranges (six devices in one) for installation in suspended ceilings. The connecting head is pluggable for quick and easy mounting. The measuring transducer is accommodated in a separate housing.

The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

It is used for daylight-dependent constant light control, to control luminaires, lighting systems, Venetian blinds and canvas blinds, and to control light intensity and sun protection hoods to avoid unnecessary heating-up of rooms. It is used in greenhouses, storage halls, industrial halls, workshops, corridors, residential and commercial buildings.

DHKF
Connecting head, pluggable



TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor (see beginning of this chapter)
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (optional other individual measuring ranges, e. g. 100 kLux)
Output:	4...20 mA or 0-10 V
Deviation:	typically < 5 % of final value
Ambient temperature:	–30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Electrical connection:	2- or 3-wire (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, **pluggable**, Ø = approx. 35 mm, H = approx. 29 mm
Mounting (sensor):	in the suspended ceiling, ceiling cut-out Ø = 30 mm, cover Ø = < 35 mm
Protection type:	**IP 65** (according to EN 60 529) Housing **IP 30** (according to EN 60 529) Sensor in the built-in state
Protection class:	III (according to EN 60 730)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (adjustable)	**DIP 1**	**DIP 2**	**DIP 3**
0...500 Lux	OFF	OFF	OFF
0... 1 kLux	**ON**	OFF	OFF
0... 2 kLux	OFF	**ON**	OFF
0... 5 kLux	**ON**	**ON**	OFF
0... **20 kLux** (default)	OFF	OFF	**ON**
0... 60 kLux	**ON**	OFF	**ON**
Note: **DIP 4, 5, 6** are not assigned!			

Connecting diagram **DHKF-U**



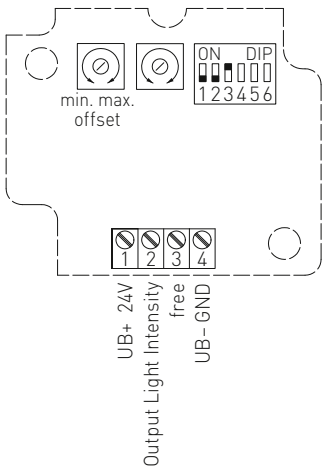
UB+ supply voltage 24V AC/DC
Output light intensity 0-10V
free
UB– GND

Connecting diagram **DHKF-I**

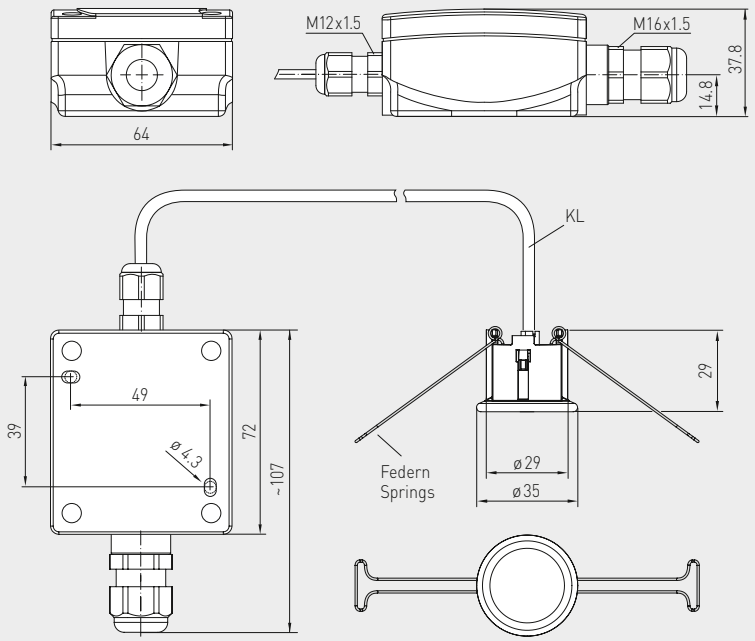


UB+ supply voltage 24V DC
Output light intensity 4...20mA

Schematic diagram **DHKF**



Dimensional drawing **DHKF**





M12 connector
(optional on request)

DHKF



PHOTASGARD® DHKF In-ceiling light intensity sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
DHKF				
DHKF I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20 mA	1601-6122-1000-000	**152,66 €**
DHKF U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-6121-1000-000	**152,66 €**
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

**Room motion sensor or presence detector,
in-wall in the panel switch programme,
with switching output**

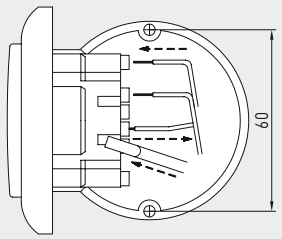
S+S REGELTECHNIK

Maintenance-free motion sensor/presence detector **KIN**ASREG® **FSBWF-W** with switching output, in in-wall housing, to detect the presence of people and movements (360° / approx. 10 m). The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

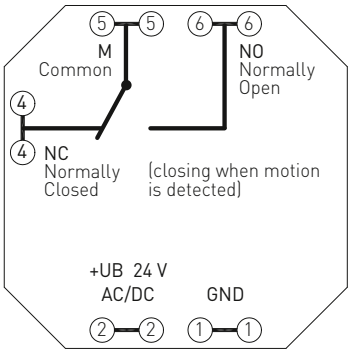
The sensor is used for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms. It is used indoors in corridors, offices, residential and business premises as well as industrial and storage halls.

The **infrared motion sensor** detects movement over an aperture angle of 90°/ 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

Mounting diagram [mm] **In-wall**



Schematic diagram **FSBWF-W**

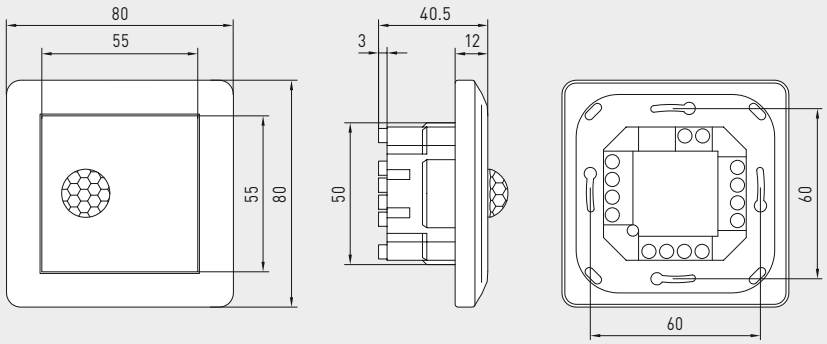


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %),
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC
MOTION	
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	360° perimeter, aperture angle 90° / 110°, range approx. 10 m, circular
Motion detection:	of people and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A resistive load
After-running time:	adjustable from approx. 4 seconds to approx. 16 minutes
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage –20...+50 °C; Operation 0...+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Dimensional drawing
[mm]

FSBWF-W



FSBWF-W



KINASREG® FSBWF-W	Room motion sensor or presence detector, in-wall			
Type / WG02	**Detection of** presence / motion	**Output** presence / motion	**Item No.**	**Price**
FSBWF-W				
FSBWF-W	Yes / No	Changeover contact	1401-5120-3000-162	**253,07 €**

Room motion sensor with switching output

S+S REGELTECHNIK

The motion sensor and presence detector **KIN**ASGARD® **RBWF** detects the presence of persons and motions and has a switching output (changeover contact). The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. Elegant housing made of plastic with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry in case of on-wall installation. The room motion sensor is used to monitor and recognise conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms as a motion detector. This residential room motion detector is installed in corridors, in outdoor areas, in industrial halls, in offices, in residential rooms and business facilities.

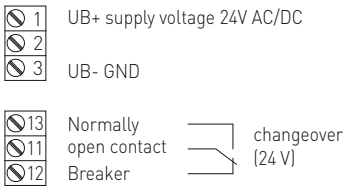
RBWF



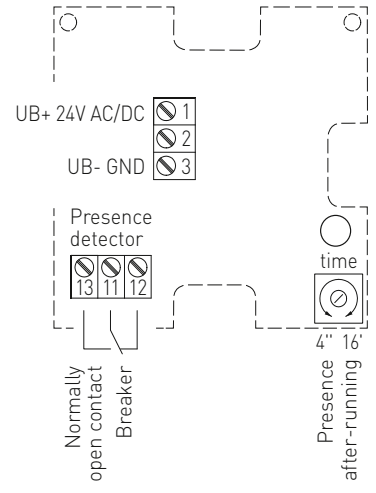
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

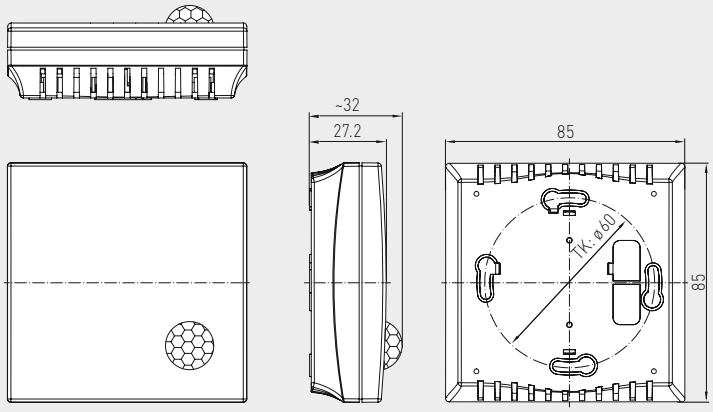
Connecting diagram **RBWF**



Schematic diagram **RBWF**



Dimensional drawing — Housing **Baldur 1** **RBWF**



KINASGARD® **RBWF** Room motion sensor				
Type / WG01	**Detection** Presence + Motion	**Output** Presence + Motion	**Item No.**	**Price**
RBWF				
RBWF-W	Yes / No (relay on / off)	Changeover contact	1401-41A0-4000-000	**112,11 €**

The motion sensor and presence detector **KIN**ASGARD® **ABWF** detects the presence of persons and motions. It is used to observe and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. The sensor recognizes changes in the infra-red radiation spectrum, so in heat radiation, resulting form the movement of persons or objects. Such movements generate a temporary change of the temperature gradient in the field. Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be > 5 K.

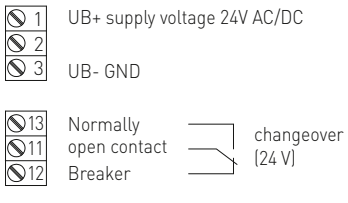
ABWF



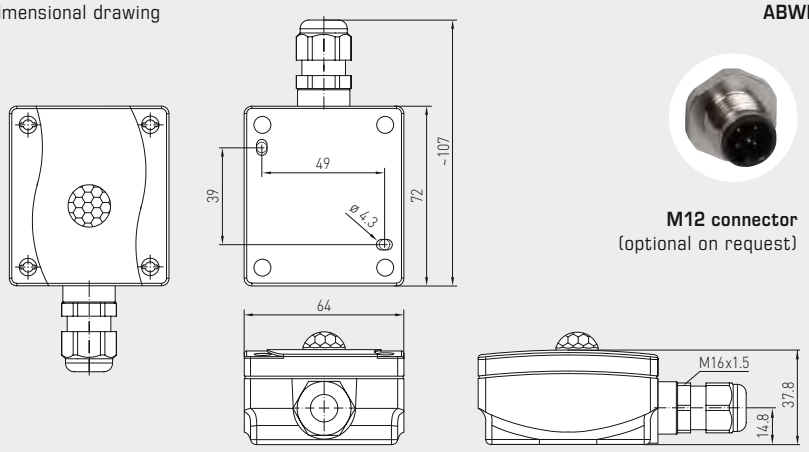
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, required temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	–10...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Connecting diagram **ABWF**

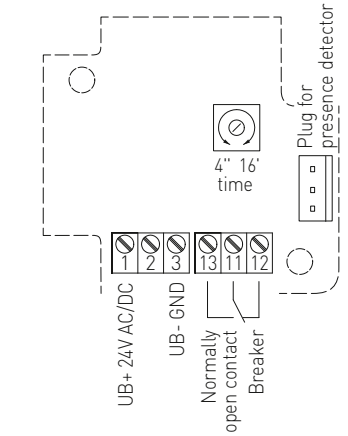


Dimensional drawing **ABWF**



M12 connector
(optional on request)

Schematic diagram **ABWF**



KINASGARD® ABWF Outdoor motion sensor

Type / WG01	Detection Presence + Motion	Output Presence + Motion	Item No.	Price
ABWF				
ABWF-W	Yes / No (relay on / off)	Changeover contact	1401-1110-4000-000	**133,71 €**

KINASGARD® DBWF
KINASGARD® DBWF-C

In-ceiling motion sensor with switching output

S+S REGELTECHNIK

The in-ceiling motion sensor and presence detector **KIN**ASGARD® **DBWF / DBWF-C** detects the presence of persons and movements and has a switching contact as an output. It has been designed for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms.
The in-ceiling motion sensor is used for installation in suspended ceilings in corridors, offices, as well as in residential and business facilities. The connecting head is pluggable for quick, easy mounting. The measuring transducer is accommodated in a separate housing.
The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

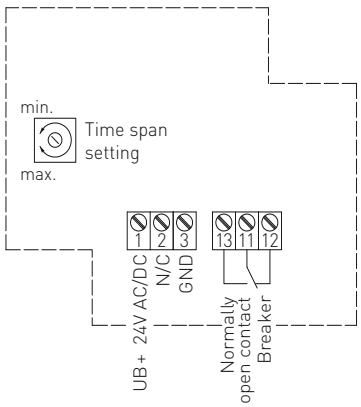
DBWF
DBWF-C
connecting head, pluggable



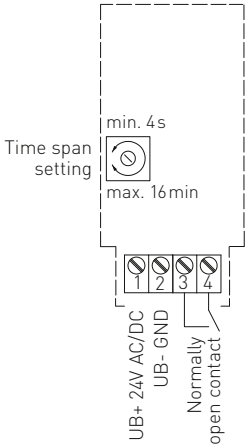
TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
After-running time:	adjustable from 4 seconds to 16 minutes
Ambient temperature:	–10...+50 °C
Connecting head:	plastic, material polycarbonate (PC), colour white, **pluggable**
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Mounting (sensor):	in the suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Protection type (sensor):	**IP 30** (according to EN 60 529) in the built-in state
Protection class (sensor):	III (according to EN 60 730)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
DBWF measuring transducer	
Output:	potential-free **changeover contact** (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protection type (housing):	**IP 65** (according to EN 60 529) (Tyr 1)
DBWF-C measuring transducer	
Output:	potential-free **normally open contact**, signal relay, max. 24 V / 0.5 A
Housing:	plastic, material PVC, colour black
Housing dimensions:	55 x 20 x 15 mm (compact form)
Protection type (housing):	**IP 20** (according to EN 60 529) (compact form)

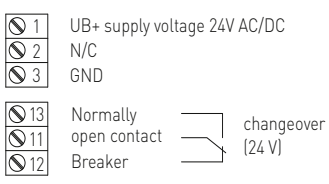
Schematic diagram **DBWF**



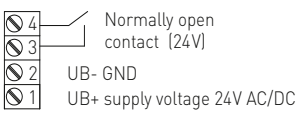
Schematic diagram **DBWF-C**



Connection diagram **DBWF**

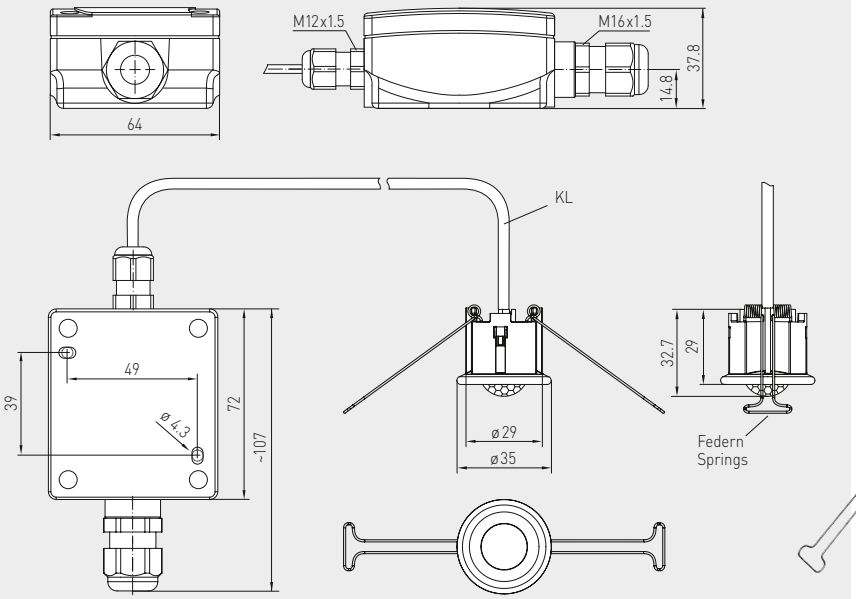


Connection diagram **DBWF-C**



Dimensional drawing

DBWF





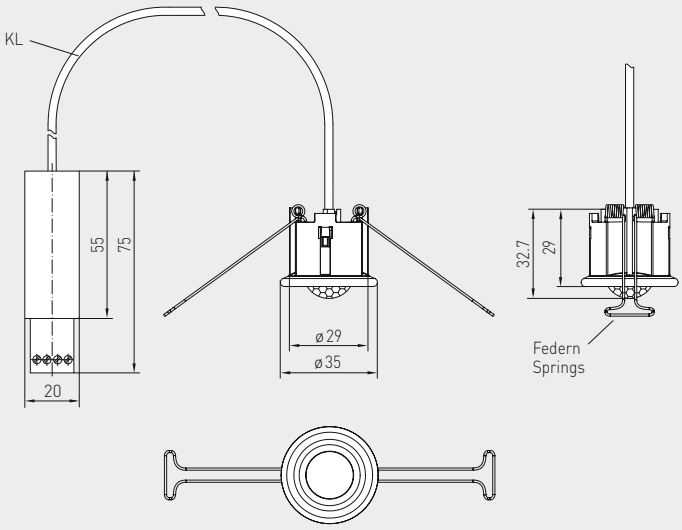
M12 connector
(optional on request)

DBWF



Dimensional drawing

DBWF-C
compact form



DBWF-C
compact form



KINASGARD® DBWF In-ceiling motion sensor **KINASGARD® DBWF-C** In-ceiling motion sensor, compact form				
Type / WG01	**Detection** Presence + Movement	**Output** Presence + Movement	**Item no.**	**Price**
DBWF				
DBWF-W	Yes / No (relay on / off)	Changeover contact	1401-6120-3000-000	**143,23 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	
DBWF-C				
DBWF-C	Yes / No (relay on / off)	Normally open contact	1401-6130-1000-006	**107,10 €**

**Room motion sensor and light sensor,
multisensors with active and switching output**

S+S REGELTECHNIK

The room motion and light sensor and presence detector **KIN**ASGARD® **RBWF-LF** is a combined instrument that detects motion and light intensity using a diffuser as well as the presence of persons and is used to recognize conditions. RBWF-LF issues a standard signal of 0 - 10 V or 4...20 mA for light intensity and has a switching (normally open contact) output for detecting motion.

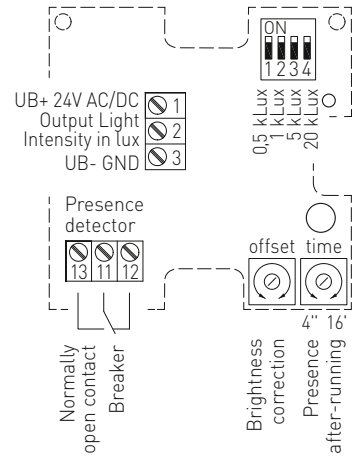
This multi-sensor is used in building automation, in corridors, at workplaces, in industrial halls, in offices and business facilities for the control of lighting as needed, e.g. to control sunshade equipment, for daylight-dependant constant light control, for activating Venetian blinds or luminaries, for automatic energy conservation, and to avoid unnecessary heating-up or cooling of unoccupied rooms.

TECHNICAL DATA

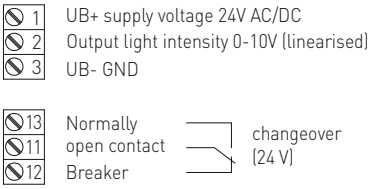
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor with diffuser (see beginning of this chapter)
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 5 kLux / 20 kLux** (other individual ranges optional, e. g. 100 kLux)
Output, light sensor:	0-10 V (linearised, active, 3-wire connection) or 4...20 mA
Deviation, light sensor:	typically < 5 % of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	**ON**	OFF	OFF	OFF
0... **1 kLux** (default)	OFF	**ON**	OFF	OFF
0... 5 kLux	OFF	OFF	**ON**	OFF
0... 20 kLux	OFF	OFF	OFF	**ON**

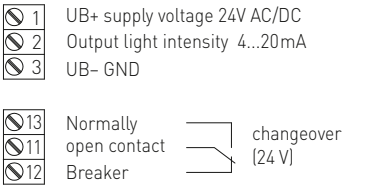
Schematic diagram **RBWF/LF**



Connecting diagram **RBWF/LF-U**

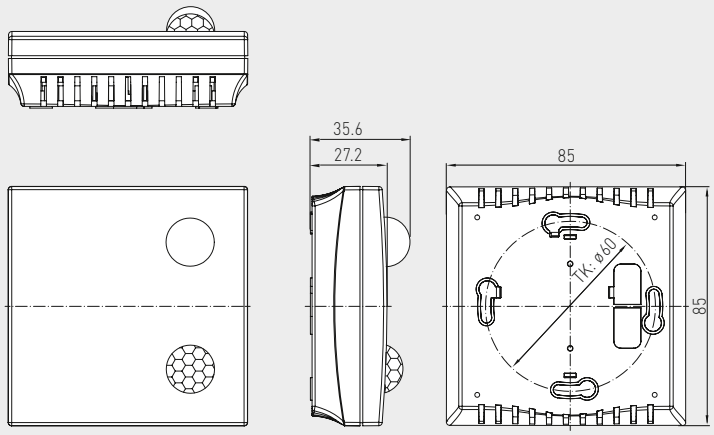


Connecting diagram **RBWF/LF-I**



Dimensional drawing

Housing **Baldur 1**
RBWF/LF



RBWF/LF



KINASGARD® **RBWF/LF**	Room motion sensor and light sensor			
Type / WG01	**Detection, Measuring Range**	**Output**	**Item No.**	**Price**
RBWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-1100-000	**169,98 €**
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0 -10 V (linearised)		
RBWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-3200-000	**169,98 €**
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4...20 mA		
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	

S+S REGELTECHNIK

**Outdoor motion sensor and light sensor,
multisensors with active and switching output**

The room motion and light sensor and presence detector **KIN**ASGARD® **ABWF / LF** is a combined instrument that detects motions and light intensity as well as the presence of persons and is used to recognize conditions. ABWF / LF issues a standard signal of 0 - 10 V or 4...20 mA for light intensity and has a switching (changeover contact) output for the detection of motions.

The motion sensor / presence detector detects the presence of persons and motions. It is used to monitor and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities.

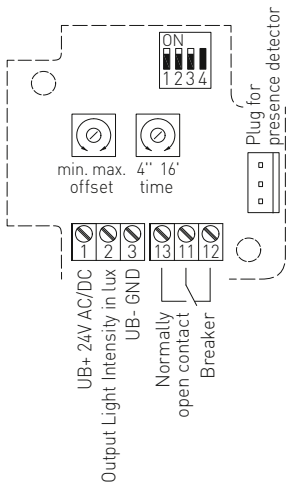
The light intensity sensor / twilight sensor with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms.

TECHNICAL DATA

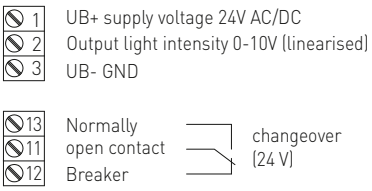
Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	R_a (ohm) = (U_b -14 V) / 0.02 A for I variant
Load resistance:	R_L > 5 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor (see beginning of this chapter)
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	**multi-range switching** (via DIP switches) **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (other individual ranges optional, e. g. 100 kLux)
Output:	0 - 10 V (linearised, active, 3-wire connection) or 4...20 mA
Deviation, light sensor:	typically < 5 % of final value
Ambient temperature:	–10...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	–
0... 1 kLux	**ON**	OFF	OFF	–
0... 2 kLux	OFF	**ON**	OFF	–
0... 5 kLux	**ON**	**ON**	OFF	–
0... **20 kLux** (default)	OFF	OFF	**ON**	–
0... 60 kLux	**ON**	OFF	**ON**	–

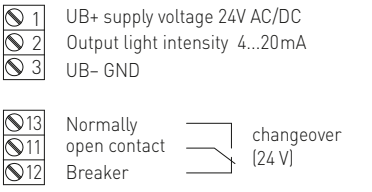
Schematic diagram **ABWF/LF**



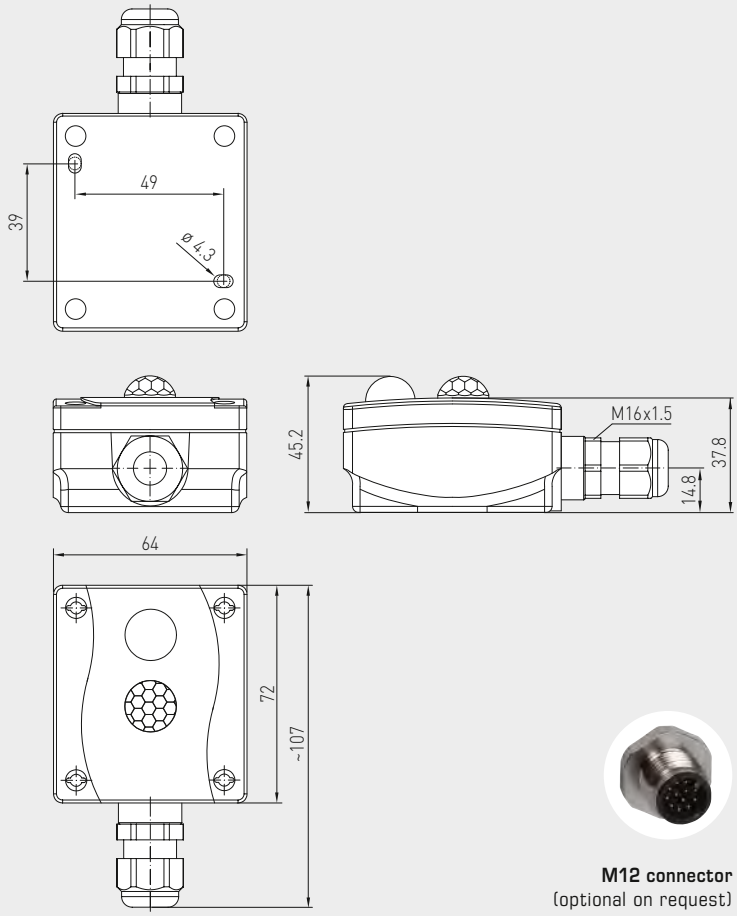
Connecting diagram **ABWF/LF-U**



Connecting diagram **ABWF/LF-I**



Dimensional drawing **ABWF/LF**



M12 connector
(optional on request)

ABWF/LF



KINASGARD® ABWF/LF Outdoor motion sensor and light sensor				
Type / WG01	**Detection, Measuring Range**	**Output**	**Item No.**	**Price**
ABWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-2100-000	**180,61 €**
2. Light Intensity	0…500 Lux / 1 / 2 / 5 / 20 / 60 kLux	**0 – 10 V** (linearised)		
ABWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-3200-000	**180,61 €**
2. Light Intensity	0…500 Lux / 1 / 2 / 5 / 20 / 60 kLux	**4...20 mA** (linearised)		
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101		on request	

KINASGARD® DBWF/LF/FTF

In-ceiling motion detector, light, humidity and temperature sensor, multisensors with switching output

S+S REGELTECHNIK

The in-ceiling sensor **KIN**ASGARD® **DBWF/ LF/ FTF** is used to detect persons within a distance of up to 10 meters and to measure luminous intensity or brightness, relative humidity and temperature. It has been designed for installation in suspended ceilings.

The sensor detects **motion** over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. If motion is detected, the potential-free relay output is switched. The hold time of the output, measured from the moment of the last detected movement, can be preset internally in the device via potentiometer within a range of 4 seconds to approx. 17 minutes.

For the **temperature and humidity**, an analogue output 0 - 10 V corresponding to 0...+50 °C or 0...100 % RH is available. Deviations due to the mounting position and location can be compensated internally using one offset regulator respectively.

For **luminous intensity or brightness** of 0...1000 lux or 0...5000 lux (selectable via DIP switches), an analogue output 0 - 10 V is also available. It is also possible to activate the motion output depending on brightness with the help of a jumper.

Fields of application for the DBWF / LF / FTF include residential room monitoring, automatic switching of lights, control technology, alarm technology, and motion-dependent control of room functions, e. g. for lowering the temperature in unused rooms.

TECHNICAL DATA

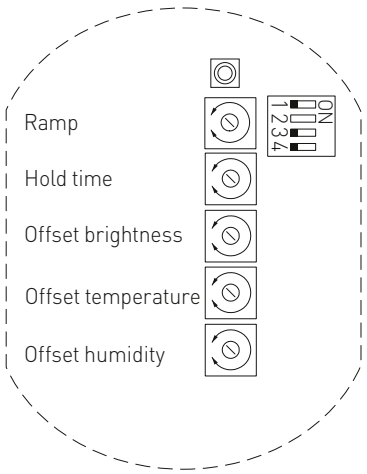
Power supply:	24 V AC / DC (half-wave rectification, read the instructions!)
Power consumption:	< 3.6 VA at 24 V DC
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Outputs:	0-10 V or inverted 10 - 0 V (selectable via DIP switches)
MOTION	
Sensor:	infra-red motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output, motion sensor:	potential-free changeover contact, for switching safety extra-low voltage only, up to 1 A
After-running time:	adjustable from 4 s to 17 min
LIGHT INTENSITY	
Sensor:	light sensor with diffusor (see beginning of this chapter)
Measuring range, light sensor:	0...1000 lux / 0...5000 lux (selectable via DIP switches)
Output, light sensor:	0 - 10 V
Deviation, light sensor:	typically < ± 10 % of final value (referred to calibration reference source, approx. 5700 K)
Temperature drift:	< ± 5 % of final value / 10 K at +20 °C
HUMIDITY	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V)
Operating range, humidity:	10...95 % RH (non-precipitating air)
Deviation, humidity:	typically **± 3 % RH** (20...80 %); at +20 °C, otherwise ± 5 % RH
Output, humidity:	0-10 V
TEMPERATURE	
Measuring range, temperature:	0...+50 °C (output corresponding to 0 - 10 V) other measuring ranges on request!
Operating range, temperature:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +20 °C, under standard conditions
Output, temperature:	0-10 V
Ambient temperature:	0...+50 °C
Storage temperature:	–20...+50 °C
Housing:	steel, white painted
Housing dimensions:	cover: Ø 96 mm, height of housing: 30 mm
Installation dimensions:	ceiling cutout: Ø 80 mm installation depth: < 45 mm (incl. connector system) on-wall protrusion: > 13 mm (motion sensor) > 20 mm (humidity sensor)
Sensor protection:	mounted inside ceiling installation housing
Protection class:	III (according to EN 60 730)
Protection type (housing):	**IP 20** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU

Function output (direction adjustable)	**DIP 1**
normal (default) 0 % = 0 V 100 % = 10 V	OFF
inverted 0 % = 10 V 100 % = 0 V	**ON**

Brightness (adjustable measuring range)	**DIP 3**
0... **1000 Lux** (default)	OFF
0... 5000 Lux	**ON**

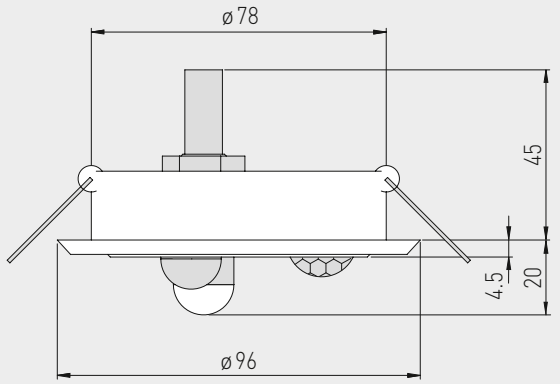
Motion (mode selectable)	**DIP 4**
Motion mode (default) Motion detector is independent of threshold value	OFF
Auto mode If the set threshold value is not reached, the motion detector is active	**ON**

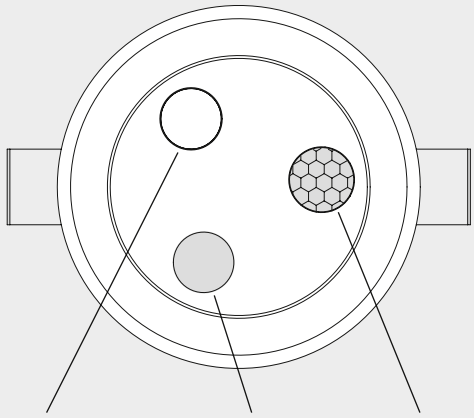
Schematic diagram **DBWF/LF/FTF**
Circuit board



DIP switch 2 is not assigned!

Dimensional drawing **DBWF/LF/FTF**



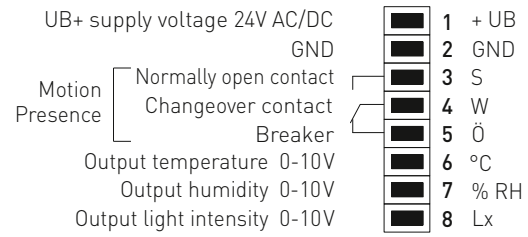


DBWF/LF/FTF





Connecting diagram
Rear side of housing **DBWF/LF/FTF**



KINASGARD® DBWF/LF/FTF In-ceiling motion, light, temperature and humidity sensor				
Type / WG02	**Detection, Measuring Range**	**Output**	**Item No.**	**Price**
DBWF-LF-FTF-W				
1. Presence + Motion	yes / no (relay on / off)	Changeover contact	1401-6114-3100-000	**242,89 €**
2. Light Intensity	0...1000 lux / 0...5000 lux (DIP)	0-10 V (linearised)		
3. Temperature	0 ... 50 °C	0 - 10 V		
4. Humidity	0...100 % RH	0 - 10 V		
Outputs: **0-10 V or inverted 10-0 V** (selectable via DIP switches)				

Air Quality & Flow

AERASGARD®, **RHE**ASGARD® & **RHE**ASREG®
Feel-good climate with energy efficiency

Increased CO2 values, particulate matter or VOC pollution are detrimental with regard to energy costs and well-being. Our air quality and flow sensors allow you to monitor the entire indoor climate in a controlled manner. And our flow monitors and controllers put you firmly in control of lines carrying air, gas or liquid.

Application Areas

- Ventilation and air conditioning
- Ventilator flow monitoring, butterfly valves, heating registers and humidifiers
- Energy management
- Residential, working and conference rooms
- Movie theaters, showrooms and retail stores
- Institutes and laboratories



S+S REGELTECHNIK



AERASGARD®, **RHE**ASGARD® & **RHE**ASREG®
AIR QUALITY SENSORS, FLOW SENSORS AND MONITORS

CO2 sensors

FSCO2	In-wall CO2 sensor	**595**
FSTM-CO2	In-wall temperature / CO2 sensor	**595**
RCO2-AS xx	CO2 Room traffic light with signal tone	**581**
RCO2-SD	Room CO2 sensor	**585**
RCO2-W	Room CO2 sensor	**585**
RTM-CO2-SD	Room temperature CO2 sensor	**589**
RFTM-CO2-W	Room humidity / temperature / CO2 sensor	**589**
ACO2-SD	On-wall CO2 sensor	**599**
ACO2-W	On-wall CO2 sensor	**599**
ATM-CO2-SD	On-wall temperature / CO2 sensor	**605**
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	**605**
KCO2-SD	Duct CO2 sensor	**615**
KCO2-W	Duct CO2 sensor	**615**
KTM-CO2-SD	Duct temperature / CO2 sensor	**621**
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	**621**
RPCO2-W	Room pendulum CO2 sensor NEW	**623**

VOC sensors

FSLQ	In-wall-air quality sensor	**597**
RLQ-SD	Room air-quality sensor	**577**
RLQ-W	Room air-quality sensor	**577**
KLQ-SD	Duct air-quality sensor	**611**
KLQ-W	Duct air-quality sensor	**611**

Fine dust sensors (PM)

RPS-SD	Room fine dust sensor	**593**
RFTM-PS-W	Room humidity / temperature / fine dust sensor	**593**
APS-SD	On-wall fine dust sensor	**607**

Multifunctional sensors VOC / CO2 / fine dust (PM)

RLQ-CO2-W	Room air-quality / CO2 sensor	**589**
RFTM-LQ-CO2-W	Room humidity / temperature / air-quality / CO2 sensor	**589**
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor	**593**
ALQ-CO2-W	On-wall air-quality / CO2 sensorr	**605**
AFTM-LQ-CO2-W	On-wall humidity / temperature / air-quality / CO2 sensor	**605**
KLQ-CO2-W	Duct air-quality / CO2 sensor	**621**
KFTM-LQ-CO2-W	Duct humidity / temperature / air-quality / CO2 sensor	**621**

Airflow monitors

KHSSF	Top-hat rail airflow sensor with external duct probe NEW	**627**
KHSSW	Top-hat rail airflow monitor with external duct probe NEW	**627**
KLGF	Duct airflow monitor NEW	**631**
KLGFVT	Duct sensor for air flow, volume flow and temperature NEW	**631**
KLSW	Duct airflow monitor NEW	**631**
SW	Flow monitor, mechanical	**635**
WFS	Wind vane switch, mechanical	**633**

Accessories

see chapter Accessories	**646**

Note concerning type designation:
W = with changeover contact

Air Quality & Flow

AERASGARD®, **RHE**ASGARD® & **RHE**ASREG®
Multifunctional sensor technology for air quality and more

Broad Spectrum

Our active devices for measuring and regulating CO2, gas mixtures (VOC), fine dust (PM) and flows are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. DIP switches are used to select functions such as multi-range switching, automatic mode, and manual calibration.

Optimum Precision

The devices are tested according to the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Tested safety and certified quality

RoHS conforming materials

ESD compliant manufacturing

CE conformity

UKCA conformity (UK Conformity Assessed)

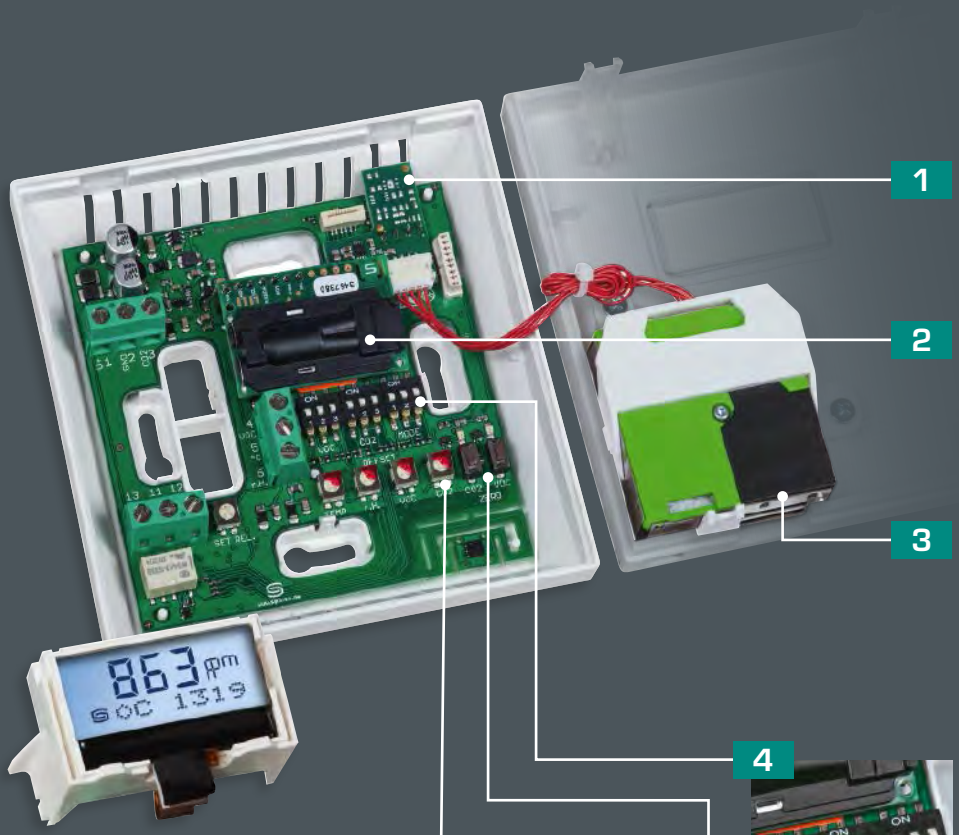
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

EAC certified

GOST certified

PROUDLY MADE IN GERMANY

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1

VOC Sensor

For mixed gases and air quality

2

CO2 Sensor

Calibration and balancing is done by means of the bus system in climate cabinets

3

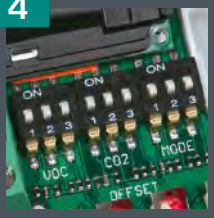
Fine dust sensor (PM)

Optical particle sensor with laser and contamination resistance technology

Optional Display

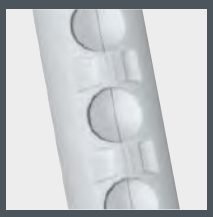
With backlighting

4



DIP Switches

For individual adjustment of measuring ranges, output, automatic zero point and relay assignment



PLEUROFORM™

Multi-channel pipe for simultaneous measuring of CO2 and VOC

5



Trigger

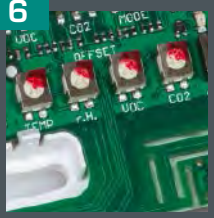
For CO2 or VOC zero point



Air Pressure Compensation

Premium duct sensors with barometric air pressure compensation of CO2 readings

6



Potentiometer

For setting the relay thresholds for CO2 and VOC. For setting the offsets for temperature, humidity, CO2 and VOC



General information
Atmospheric pressure, measurement methods and compensation

Due to the increasing demands for accuracy, low maintenance, and long-term stability, we have further developed and improved our established switchable measuring system. The new generation of devices now includes two-beam measurement technology and atmospheric pressure compensation for CO_2 measurement.

Compensation

In building automation up to now, compensating for the influence of atmospheric pressure was neglected. Due to low- and high-pressure weather conditions and differing altitudes above sea level, barometric pressure variations of up to ± 100 mbar can apply. This can result in measurement errors of up to ± 16 % of the measured value in an uncompensated systems. Our new generation of devices features an integrated atmospheric pressure measurement that compensates CO_2 reading accordingly.

S+S Regeltechnik supplies measuring instruments for CO_2 or VOC measurement in various types of design and, in contrast to other manufacturers, combined devices for CO_2 and VOC measurement with separate sensors for both of these measurands in addition to several switchable measuring ranges.

The most important aspect of ventilation on an as-needed basis is the general room air quality, often also referred to as the "comfort zone". Aside from the generally known and accepted control variables, such as relative humidity and temperature, CO_2 and VOC concentrations in the air are also important parameters to be controlled. Each individual interprets room air and its quality differently.

For that reason, air quality can only be defined in rather general terms. The air must be perceived as pleasant by a majority of people and it must not lead to any discomfort. Air must not contain any hazardous concentrations of pollutants. In this respect, the opinions of persons entering the room are decisive. This is because they soon become accustomed to their surroundings and therefore to the various pollution burdens, which they then no longer notice. An important function of systems for energy-saving ventilation on an as-needed basis is to guarantee good room air quality.

Carbon dioxide

A measuring system based on NDIR (non-dispersive infra-red sensor) technology for CO_2 measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO_2 molecules in the measured section. This damping is detected by the receptor.

In building automation applications, detection of the CO_2 content in air is primarily undertaken to control non-smoking rooms occupied by varying numbers of persons, such as conference rooms, break rooms, cinemas, schools, etc. Here, the increased CO_2 content caused by the presence of persons is interpreted as a "deterioration" of the air quality.

Over the last few years, a standard measuring range of 0...2000 ppm (parts per million) has become established for CO_2 measuring instruments. Although this measuring range covers the recommended maximum CO_2 concentrations for working and residential rooms (1000...1500 ppm), in practice however it became apparent that in many applications the measuring range of 2000 ppm does not suffice. Therefore, we have developed and launched a new generation of devices with switchable upper measuring range limits of 2000 ppm, 5000 ppm, and 10000 ppm.

Mixed gas VOC

VOC is the abbreviation for Volatile Organic Compounds. According to the definition by the World Health Organization WHO, VOC are organic substances with a boiling range from +60 to +250°C.

Examples of VOCs include compounds of the substance groups alkanes / alkenes, aromatic compounds, terpenes, halogenated hydrocarbons, esters, aldehydes, and ketones. There is a large number of naturally occurring VOCs, some of which are also released into the atmosphere in substantial quantities, e.g. terpenes and isoprene from forests.

Environmental pollution by VOC caused by human activities increased significantly throughout the last century. The biggest contributor is traffic, followed in second place by the construction sector with construction chemistry products such as coating compounds, adhesives, or sealing compounds. Potential sources of VOC in indoor spaces in addition to construction materials include furnishing objects, cleaning and care products, hobby and do-it-yourself products, office chemicals and, above all, tobacco smoke. An essential carrier of VOC is floor carpeting. Odour problems due to VOC can also be caused be microbes, or metabolic substances from bacteria and fungi.

It is precisely these types of substances mentioned and their increased occurrence that are ascertained. Since the air to be monitored contains a multitude of different substances to which the sensor reacts and since gas mixtures are forming, this sensor does not function selectively but reflects the overall air quality. Also the statement as to what constitutes "good air" or "bad air" cannot be definitively made, as this is an entirely subjective sensation. Ventilation is recommended starting from a value between 60 - 80 % VOC.

The sensor alters its conductivity depending on the concentration, the nature, and the mixture ratio of reducing molecules in ambient air.

CO_2 and / or VOC?

The above explanations demonstrate that there are applications for CO_2 measurement, for VOC measurement, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. A NDIR CO_2 measuring instrument measures selectively and cannot detect any VOC, a VOC mixed gas sensor cannot recognize CO_2 molecules.

The new duct sensor featuring the Tyr 2 housing design with **PLEUROFORM**™ multi-channel pipe handles this separation perfectly, can record both CO_2 concentration as well as VOC mixed gas (or gas pressure) and, if necessary, can function as a genuine multifunctional device that delivers humidity and temperature data.

AERASGARD® RLQ-W
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

RLQ-W
RLQ-SD



Maintenance-free room sensor **AER**ASGARD® **RLQ-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the air quality (0...100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

Maintenance-free room sensor **AER**ASGARD® **RLQ-W** with active/switching output, automatic calibration in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the air quality (0...100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

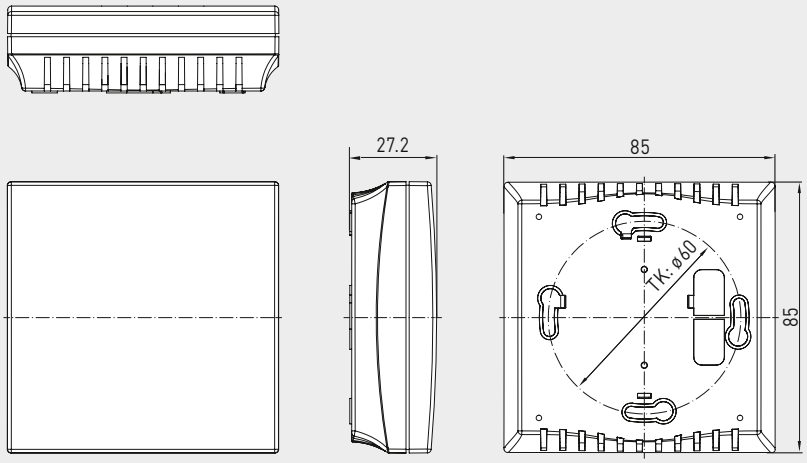
For more information, see the start of the chapter.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	VOC sensor (metal oxide) (VOC = volatile organic compounds),, with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) **RLQ-SD** 0-10 V (fixed) **RLQ-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**RLQ-SD** without changeover contact **RLQ-W** with potential-free **changeover contact** (24 V / 1 A) (switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Ambient temperature:	0...+ 50 °C
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), optional stainless steel **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**with traffic light indicator** (five coloured LEDs, see table) for displaying the air quality.

Dimensional drawing

RLQ-W
RLQ-SD

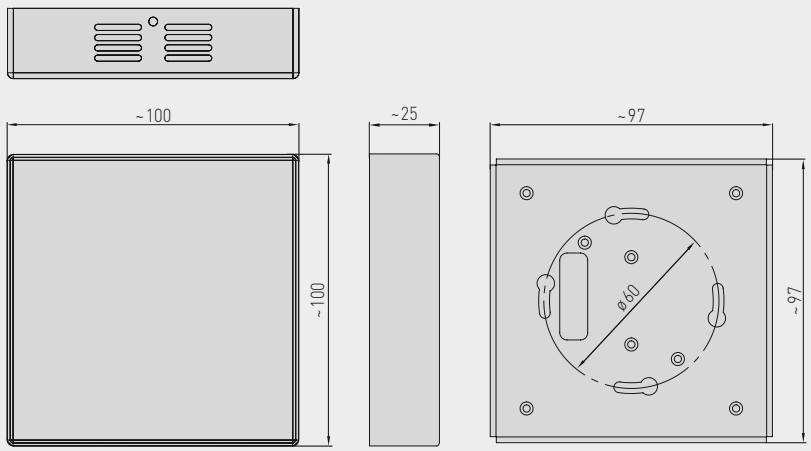


RLQ-W-A
with LEDs



Dimensional drawing

RLQ-W VA



RLQ-W VA
(stainless steel housing)

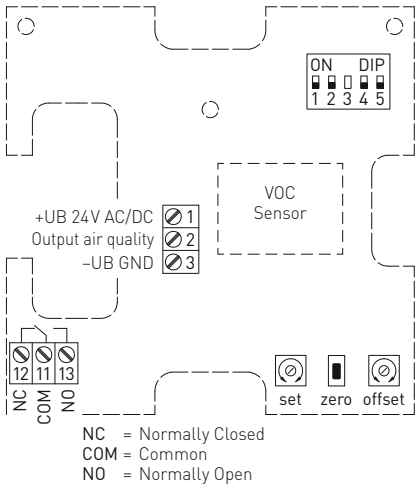


AERASGARD® RLQ-W
AERASGARD® RLQ-SD

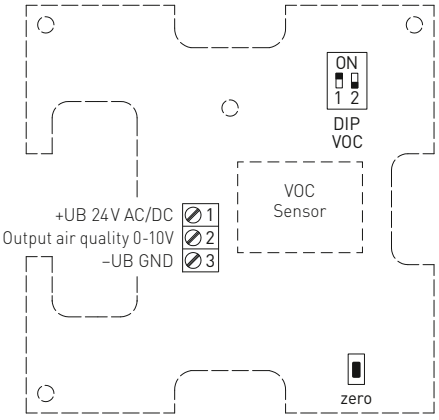
Room air quality sensor (VOC) and measuring transducer, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

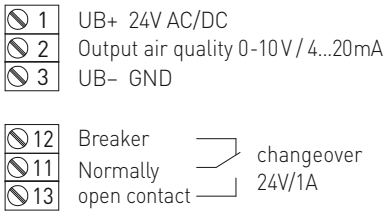
Connecting diagram **RLQ-W**



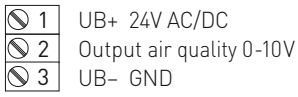
Connecting diagram **RLQ-SD**



Schematic diagram **RLQ-W**



Schematic diagram **RLQ-SD**



DIP switches	RLQ-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
Output		**DIP 4**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Traffic light (5x LEDs)		**DIP 5**
deactivated		OFF
activated		**ON**
Note: **DIP 3** is not assigned!		

DIP switches	RLQ-SD	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination *(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)*

Traffic light indicator					RLQ-W-A
VOC content	**LED 1** green	**LED 2** green	**LED 3** yellow	**LED 4** yellow	**LED 5** red
0 %	25 %	–	–	–	–
5 %	50 %	–	–	–	–
10 %	75 %	–	–	–	–
15 %	**100 %**	–	–	–	–
20 %		25 %	–	–	–
25 %		50 %	–	–	–
30 %		75 %	–	–	–
35 %		**100 %**	–	–	–
40 %			25 %	–	–
45 %			50 %	–	–
50 %			75 %	–	–
55 %			**100 %**	–	–
60 %				25 %	–
65 %				50 %	–
70 %				75 %	–
75 %				**100 %**	–
80 %					25 %
85 %					50 %
90 %					75 %
95 %					**100 %**
100 %					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 25 %, 50 %, 75 % and 100 %); LEDs that are already active continue to be illuminated.

RLQ-W-A
with LEDs





AERASGARD® RLQ-SD Room air quality sensor (VOC) and measuring transducer, *Standard*
AERASGARD® RLQ-W Room air quality sensor (VOC) and measuring transducer, *Premium*

Type/WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
RLQ-SD		(fixed)			
RLQ-SD-U	0...100 %	0-10 V	–	1501-61C0-1001-500	**177,52 €**
RLQ-W		(switchable)			
RLQ-W	0...100 %	0-10 V / 4...20 mA	Changeover contact	1501-61C0-7301-500	**186,06 €**
RLQ-W VA	0...100 %	0-10 V / 4...20 mA	Changeover contact, stainless steel housing	1501-61C0-7301-505	**297,54 €**
RLQ-W-A		(switchable)		**with traffic light**	
RLQ-W-A	0...100 %	0-10 V / 4...20 mA	Changeover contact, LEDs	1501-61C0-7331-500	**212,28 €**
	A = with "traffic light" (five coloured LEDs) for displaying the air quality (VOC).				
Note:	This unit **must not** be used as safety-relevant device!				

AERASGARD® RCO2-AS xx

**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RCO2-AS xx** with traffic-light indicator and acoustic signal, self-calibrating, in an attractive plastic housing, for determining the CO2 content of the room air (0...3000 ppm). The measuring transducer converts the measurand to a standard signal, which is directly presented visually via coloured LEDs (traffic light indicator). An additional signal tone sounds when the warning levels are reached (can be switched off via DIP switch).

Available as a table-top unit**RCO2-AS NT ST** with micro USB power cord and stainless steel stand holder, as well as the device versions **RCO2-AS NT** (with plug-in power supply unit), **RCO2-AS UPNT** (with in-wall power supply unit) and **RCO2-AS** (without power supply unit) for wall mounting.

The room filter with **CO2 traffic light** is used in classrooms, training rooms and convention centres, offices, hotels, apartments, shops, etc. and is used for easy and quick evaluation of the indoor climate. This enables energy-saving demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). You will find more information at the beginning of the chapter.

RCO2-AS
without power supply unit



RCO2-AS UPNT
with in-wall power supply unit





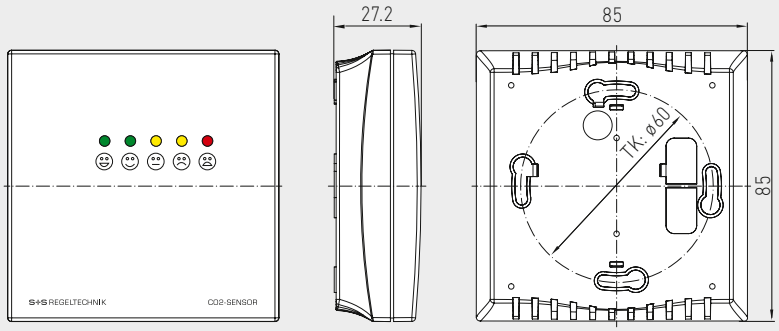
TECHNICAL DATA

Power supply:	**RCO2-AS:**	5...24 V DC
	RCO2-AS UPNT:	5...24 V DC / 230 V AC (power supply unit)*
	RCO2-AS NT:	5...24 V DC / 230 V AC (power supply unit)*
	RCO2-AS NT ST:	5 V DC / 230 V AC (power supply unit)* *(included in the scope of delivery)
electrical connection:	**RCO2-AS:**	terminal screws on circuit board (0.14 - 1.5 mm²), without power supply unit
	RCO2-AS UPNT:	terminal screws on circuit board (0.14 - 1.5 mm²), in-wall power supply unit (open cable ends)
	RCO2-AS NT:	terminal screws on circuit board (0.14 - 1.5 mm²), plug-in power supply unit (open cable ends/Euro plug)
	RCO2-AS NT ST:	Micro-USB socket on circuit board, Micro-USB power supply (micro-USB/Euro plug)
Connection type:	2-wire circuit (no reverse polarity protection!)	
Sensor:	optical NDIR sensor (non-dispersive infrared technology), with manual calibration (via zero button) with automatic calibration	
Measurement range:	0...3000 ppm	
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value	
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is greater)	
Pressure dependence:	± 0.13 % / mm Hg	
Long-term stability:	< 2 % in 15 years	
Gas exchange:	by diffusion	
Ambient temperature:	0...+ 50 °C	
Warm-up time:	approx. 1 hour	
Measuring interval:	< 3 seconds	
Housing:	plastic, material ABS, colour: pure white (similar to RAL 9010)	
Dimensions:	85 x 85 x 27 mm (Baldur 1 housing) 110 x 85 x 100 mm (housing for stand holder)	
Mounting:	**RCO2-AS NT ST:** immediately usable free-standing device without mounting (plug-and-play) **RCO2-AS, RCO2-AS NT, RCO2-AS UPNT:** wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation	
Protection class:	III (according to EN 60 730)	
IP rating:	**IP 30** (according to EN 60 529)	
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2014 / 30 / EU, low voltage directive 2014 / 35 / EU	
Equipment:	**traffic light indicator** (five coloured LEDs), **acoustic signal** (signal can be switched off) for displaying the CO2 concentration Type-specific equipment (see table): **Plug-in power supply unit** (CL = approx. 1.5 m) **In-wall power supply unit** for mounting on in-wall flush boxes **Stand holder** made from stainless steel	

**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

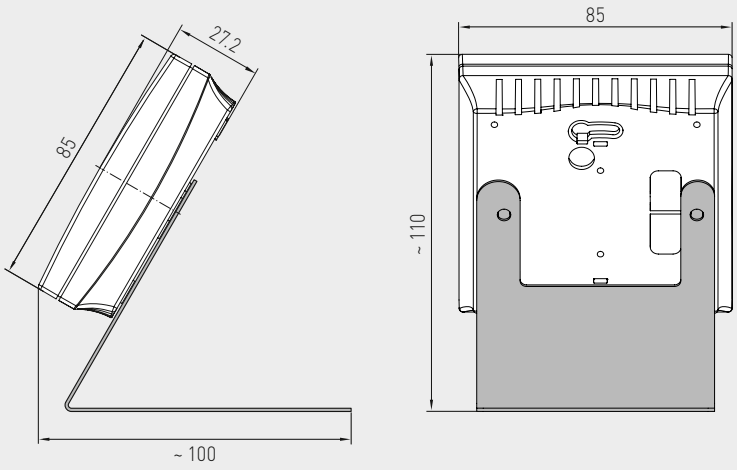
Dimensional drawing
(Baldur 1)

RCO2-AS xx



Dimensional drawing
with stand holder

RCO2-AS NT ST



RCO2-AS NT
with plug-in power supply unit



RCO2-AS NT ST
with Micro-USB power supply unit
and stainless steel
stand holder



**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

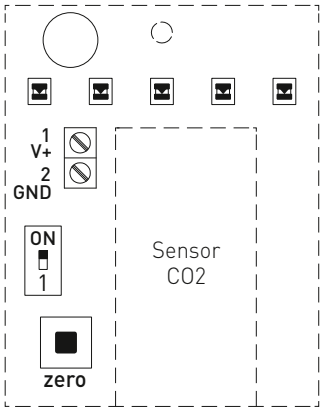
S+S REGELTECHNIK

Indicator						RCO2-AS xx
CO2 content [ppm]	**LED 1** green	**LED 2** green	**LED 3** yellow	**LED 4** yellow	**LED 5** red	**signal tone**
< 400	20 %	–	–	–	–	
401 - 500	40 %	–	–	–	–	
501 - 600	60 %	–	–	–	–	
601 - 700	80 %	–	–	–	–	
701 - 800	**100 %**	–	–	–	–	
801 - 840		20 %	–	–	–	
841 - 880		40 %	–	–	–	
881 - 920		60 %	–	–	–	
921 - 960		80 %	–	–	–	
961 - 1000		**100 %**	–	–	–	
1001 - 1080			20 %	–	–	1x **0.5 s**
1081 - 1160			40 %	–	–	
1161 - 1240			60 %	–	–	
1241 - 1320			80 %	–	–	
1321 - 1400			**100 %**	–	–	
1401 - 1520				20 %	–	2x **0.5 s**
1521 - 1640				40 %	–	
1641 - 1760				60 %	–	
1761 - 1880				80 %	–	
1881 - 2000				**100 %**	–	
2001 - 2200					20 %	3x **0.5 s**
2201 - 2400					40 %	
2401 - 2600					60 %	
2601 - 2800					80 %	
2801 - 3000					**100 %**	1x **1.5 s**

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20 %, 40 %, 60 %, 80 % and 100 %);
LEDs that are already active continue to be illuminated.

Recommendation		RCO2-AS xx
Level	**Traffic light indicator** Actions	**signal tone** (0.5 sec)
1	**green** no action required	
2	**green** prompt airing recommended	
3	**yellow** airing recommended	
4	**yellow** airing required	
5	**red** intensive airing necessary	

Schematic diagram **RCO2-AS xx**



Connecting diagram **RCO2-AS**
RCO2-AS UPNT

1 UB+ 24V AC/DC
2 UB– GND

ATTENTION:
No reverse polarity protection!

DIP switches	RCO2-AS xx
Acoustic signal (can be switched off)	**DIP 1**
active signal tone On (default)	**ON**
deactivated signal tone Off	OFF



**CO2 traffic light / mobile CO2 sensor,
room CO2 sensor with traffic light indicator and acoustic signal,
self-calibrating**

RCO2-AS
without power supply unit



RCO2-AS UPNT
with in-wall power supply unit

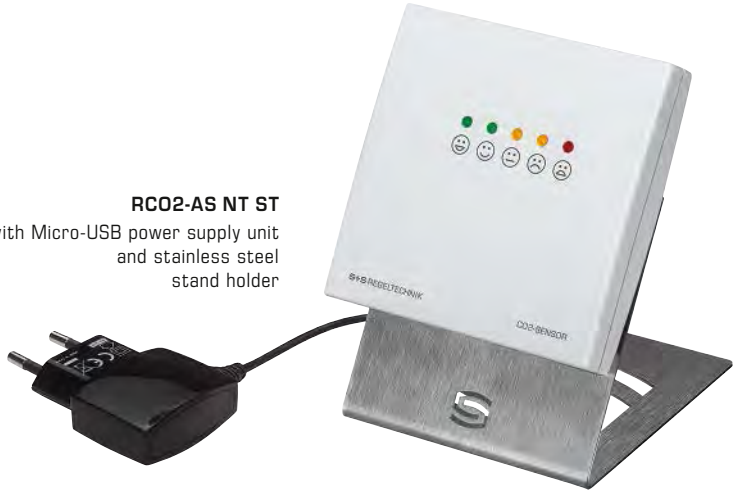




RCO2-AS NT
with plug-in power supply unit



RCO2-AS NT ST
with Micro-USB power supply unit
and stainless steel
stand holder



AERASGARD® RCO2-AS xx	Room CO2 sensor with traffic light display and acoustic signal				
Type / WG02	**Measuring ranges** CO2	**Display** CO2	**Equipment**	**Item no.** (Baldur 1)	**Price**
RCO2-AS xx					
RCO2-AS	0...3000 ppm	5 LEDs, signal tone	without power supply unit	1501-61A0-0686-230	**207,78 €**
RCO2-AS NT	0...3000 ppm	5 LEDs, signal tone	Plug-in power supply unit	1501-61A0-0686-232	**212,22 €**
RCO2-AS NT **ST**	0...3000 ppm	5 LEDs, signal tone	Micro-USB power supply unit, **stainless steel stand holder**	1501-61A0-0686-231	**208,94 €**
RCO2-AS UPNT	0...3000 ppm	5 LEDs, signal tone	In-wall power supply unit	1501-61A0-0686-233	**309,76 €**
Note:	This unit must **not** be used as a safety-relevant device!				

AERASGARD® RCO2 - W
AERASGARD® RCO2 - SD

Room CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RCO2 - SD** with active output, automatic calibration (fixed), in an elegant plastic housing with snap-on lid, for determining the CO2 content of the air (0...2000 ppm). The measuring transducer converts the measured values into a standard signal of 0 -10 V.

Maintenance-free room sensor **AER**ASGARD® **RCO2 - W** with active/switching output, automatic calibration (can be deactivated), in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0 -10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

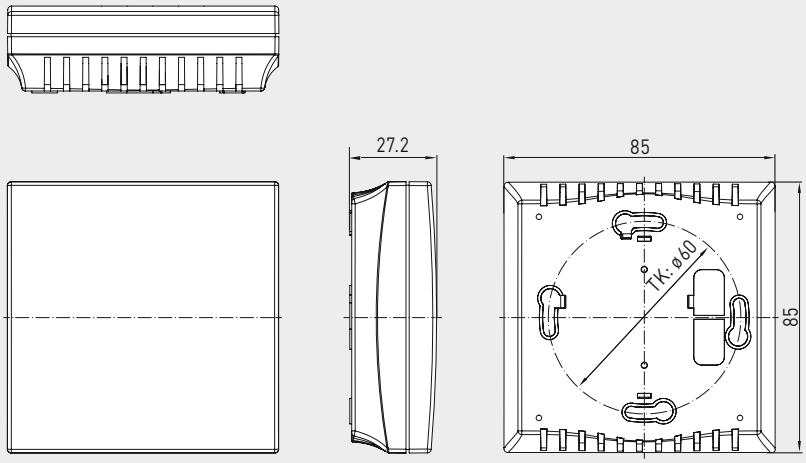
For more information, see the start of the chapter.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	Optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **RCO2 - SD** with automatic calibration (fixed) **RCO2 - W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**RCO2 - SD** 0...2000 ppm (fixed) **RCO2 - W** 0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output:	**RCO2 - SD** 0 -10 V (fixed) **RCO2 - W** 0 -10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**RCO2 - SD** without changeover contact **RCO2 - W** with potential-free **changeover contact** (24 V / 1 A)
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	0...+ 50 °C
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel housing optional **V2A** (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**with traffic light indicator** (five coloured LEDs, see table) for displaying the CO2 concentration **with display** (see **AER**ASGARD® **RFTM-LQ-CO2**) for displaying the actual CO2 content in ppm

Dimensional drawing

RCO2-W
RCO2-SD

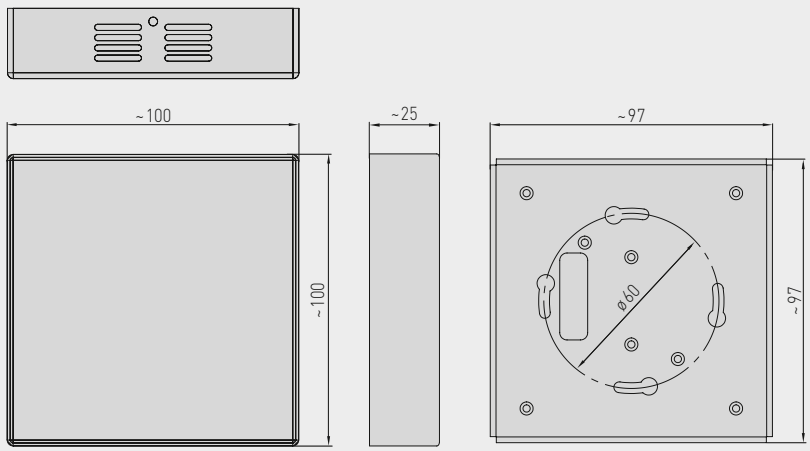


RCO2-W
RCO2-SD



Dimensional drawing

RCO2-W VA



RCO2-W VA
(stainless steel housing)

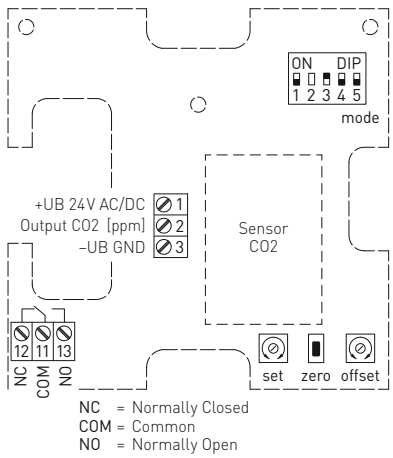


AERASGARD® RCO2-W
AERASGARD® RCO2-SD

Room CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active/switching output

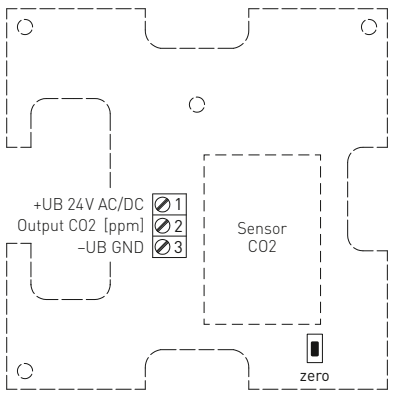
S+S REGELTECHNIK

Connecting diagram **RCO2-W**

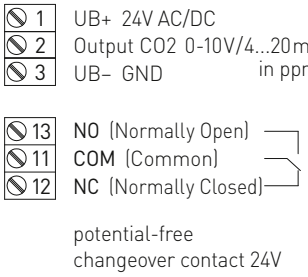


NC = Normally Closed
COM = Common
NO = Normally Open

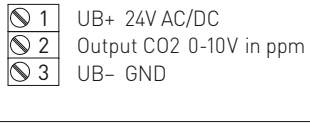
Connecting diagram **RCO2-SD**



Schematic diagram **RCO2-W**



Schematic diagram **RCO2-SD**



DIP switches	RCO2-W
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Traffic light (5x LEDs)	**DIP 5**
deactivated	OFF
activated	**ON**
Note: **DIP 2** is not assigned!	

Traffic light indicator						RCO2-W-A
CO2 content in ppm 0...2000 ppm	0...5000 ppm	**LED 1** green	**LED 2** green	**LED 3** yellow	**LED 4** yellow	**LED 5** red
350	350	20 %	–	–	–	–
416	536	40 %	–	–	–	–
482	722	60 %	–	–	–	–
548	908	80 %	–	–	–	–
614	**1094**	**100 %**	–	–	–	–
680	1280		20 %	–	–	–
746	1466		40 %	–	–	–
812	1652		60 %	–	–	–
878	1838		80 %	–	–	–
944	**2024**		**100 %**	–	–	–
1010	2210			20 %	–	–
1076	2396			40 %	–	–
1142	2582			60 %	–	–
1208	2768			80 %	–	–
1274	**2954**			**100 %**	–	–
1340	3140				20 %	–
1406	3326				40 %	–
1472	3512				60 %	–
1538	3698				80 %	–
1604	**3884**				**100 %**	–
1670	4070					20 %
1736	4256					40 %
1802	4442					60 %
1868	4628					80 %
1934	**4814**					**100 %**
2000	5000					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20 %, 40 %, 60 %, 80 % and 100 %);
LEDs that are already active continue to be illuminated.

RCO2-W-A
with LEDs





AERASGARD® RCO2-SD Room CO2 sensor and measuring transducer, *Standard*
AERASGARD® RCO2-W Room CO2 sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range CO2	Output CO2	Equipment	Display	Item No. (Baldur 1)	Price
RCO2-SD	(fixed)	(fixed)				
RCO2-SD-U	0...2000 ppm	0-10 V	–		1501-61A0-1001-200	**216,00 €**
RCO2-W	(switchable)	(switchable)				
RCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact		1501-61A0-7301-200	**255,89 €**
RCO2-W VA	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, stainless steel housing		1501-61A0-7301-205	**365,72 €**
RCO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, display	■	see **RFTM-LQ-CO2**	
RCO2-W-A	(switchable)	(switchable)			**with traffic light**	
RCO2-W-A	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, LEDs		1501-61A0-7331-200	**300,73 €**
	A = with "traffic light" (five coloured LEDs) for displaying the CO2 concentration.					
Note:	This unit **must not** be used as safety-relevant device!					

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RTM-CO2-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the CO2 content of the air (0...2000 ppm) and the temperature (0...+50°C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free room sensor **AER**ASGARD® **RFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, optionally with/without display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality in three VOC sensitivity (0...100 % VOC), the temperature (0...+50°C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology).
The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	**RCO2-W / RTM-CO2-SD:** < 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA **RLQ-CO2-W / RFTM-LQ-CO2-W:** < 4.4 W / 24 V DC typical; < 6.4 VA / 24 V AC typical; peak current 200 mA
Outputs:	**RTM-CO2-SD** 0-10 V (fixed) **Rxx-CO2-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**RTM-CO2-SD** without changeover contact **Rxx-CO2-W** with potential-free **changeover contact** (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)
HUMIDITY	
Sensor (RH / °C):	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring range (RH):	0...100 % RH
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)
Deviation (RH):	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range (°C):	0...+ 50 °C
Deviation (°C):	typically ± 0.2 K at +25 °C
Output (°C):	**RTM-CO2-SD** 0-10 V (fixed) **Rxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
AIR QUALITY (VOC)	
Sensor (VOC):	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button) and automatic calibration (permanently active)
Measuring range (VOC):	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output (VOC):	0-10 V (0 V = clean air, 10 V = polluted air) **or** 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy (VOC) :	typically ± 20 % of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions) depending on the type of loading and gas concentration
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **RTM-CO2-SD** with automatic calibration (fixed) **Rxx-CO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range (CO2):	**RTM-CO2-SD** 0...2000 ppm (fixed) **Rxx-CO2-W** 0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output (CO2):	**RTM-CO2-SD** 0-10 V (fixed) **Rxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switchesr)
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % / mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	by diffusion

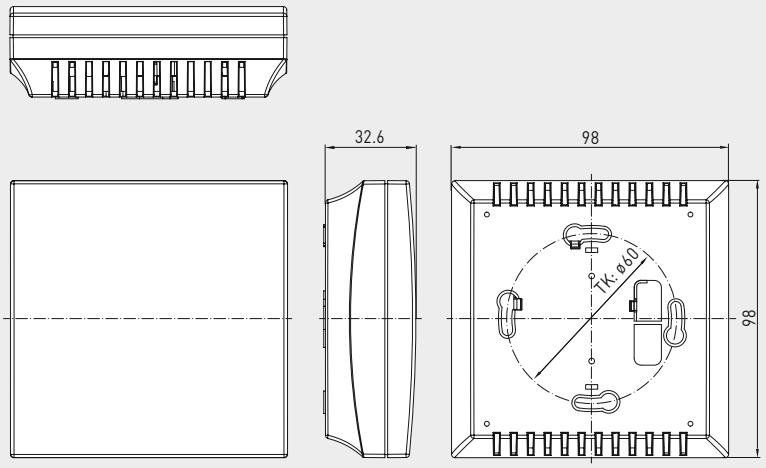
continued on next page!

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

Dimensional drawing

RCO2-W with display
RLQ-CO2-W
RFTM-LQ-CO2-W
RTM-CO2-SD

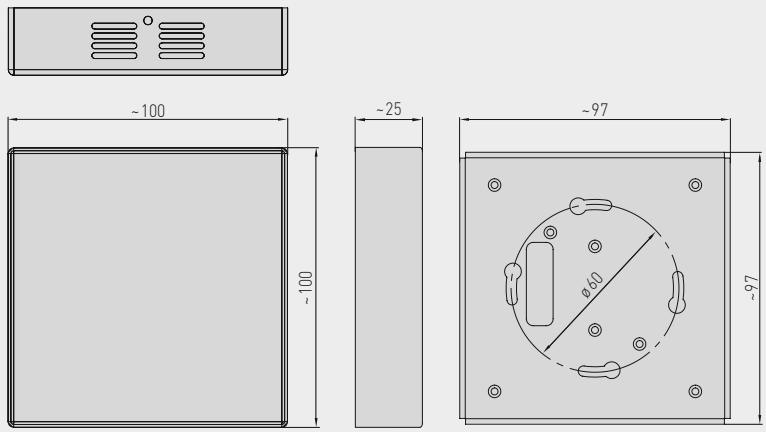


RLQ-CO2-W
RFTM-LQ-CO2-W
RTM-CO2-SD



Dimensional drawing

Stainless steel housing
(See picture on next page)



RCO2-W
RLQ-CO2-W
RFTM-LQ-CO2-W
with display



TECHNICAL DATA (continued)

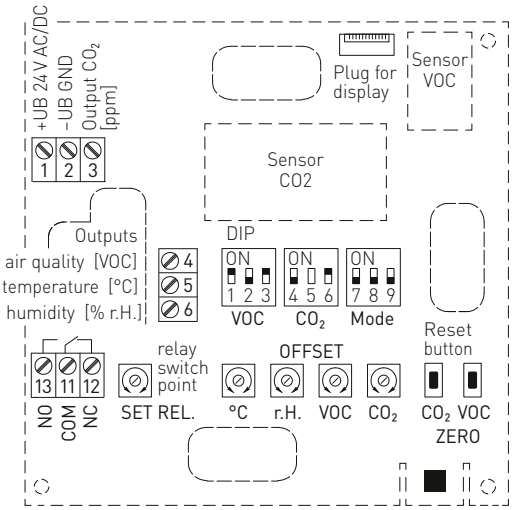
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel **V2A** (1.4301) housing optional
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU
Optional:	**display with illumination,** two line, cutout approx. 36 x 15 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

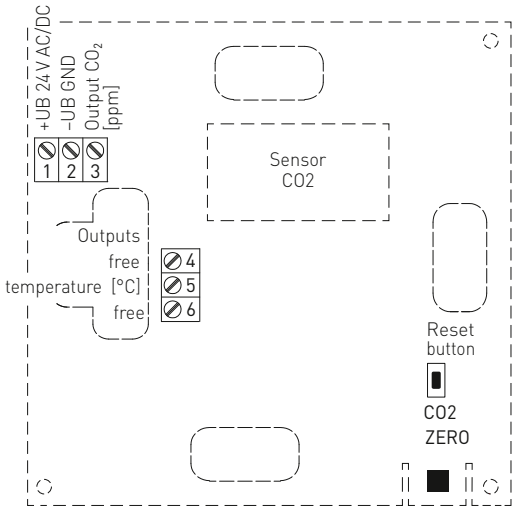
S+S REGELTECHNIK

Schematic diagram **RFTM-LQ-CO2-W**



NC = Normally Closed
COM = Common
NO = Normally Open

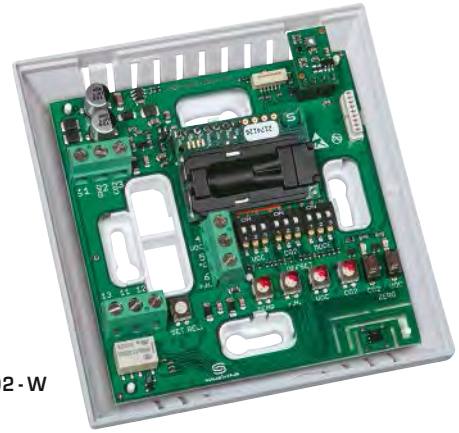
Schematic diagram **RTM-CO2-SD**



DIP switches (Baldur 2)	RFTM-LQ-CO2-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
CO2 content		**DIP 4**
0...2000 ppm (default)		OFF
0...5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	**ON**	OFF
Temperature: +5...+48 °C	OFF	**ON**
Humidity: 10...95% RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** and **DIP 5** are not assigned!		

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0...19** %
2	**good** prompt airing recommended	**20...39** %
3	**moderate** airing recommended	**40...59** %
4	**poor** increased airing required	**60...79** %
5	**unhealthy** intense airing necessary	**80...100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990–1005)



RFTM-LQ-CO2-W
(Baldur 2)



Stainless steel housing
(optionally available upon request)

AERASGARD® RCO2-W / RLQ-CO2-W
AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO2 content, calibratable, with active/switching output

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**50**	5.0	12.0
5	0.5	4.8	**55**	5.5	12.8
10	1.0	5.6	**60**	6.0	13.6
15	1.5	6.4	**65**	6.5	14.4
20	2.0	7.2	**70**	7.0	15.2
25	2.5	8.0	**75**	7.5	16.0
30	3.0	8.8	**80**	8.0	16.8
35	3.5	9.6	**85**	8.5	17.6
40	4.0	10.4	**90**	9.0	18.4
45	4.5	11.2	**95**	9.5	19.2
Continued at the right ...			**100**	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD® RTM-CO2-SD	Room temperature and CO2 sensor, *Standard*
AERASGARD® RCO2-W	Room CO2 sensor, *Premium*
AERASGARD® RLQ-CO2-W	Room air quality (VOC) and CO2 sensor, *Premium*
AERASGARD® RFTM-CO2-W	Multifunctional room sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® RFTM-LQ-CO2-W	Multifunctional room sensor for humidity, temperature, CO2 content and air quality (VOC), *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature	CO2	VOC	Equipment Display	Item No. (Baldur 2)	Price
RTM-CO2-SD			(fixed)				
RTM-CO2-SD-U	–	0...+50 °C	0...2000 ppm	–	–	1501-61B2-1001-200	**236,49 €**
RCO2-W			(switchable)				
RCO2-W (without display)	–	–	0...2000 / 5000 ppm	–	W	see **RCO2-W / RCO2-SD**	
RCO2-W **LCD**	–	–	0...2000 / 5000 ppm	–	W ■	1501-61B0-7321-200	**307,21 €**
RLQ-CO2-W			(switchable)				
RLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-61B1-7301-500	**386,67 €**
RLQ-CO2-W **LCD**	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B1-7321-500	**438,00 €**
RFTM-CO2-W			(switchable)				
RFTM-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W	1501-61B6-7301-200	**361,22 €**
RFTM-CO2-W **LCD**	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W ■	1501-61B6-7321-200	**400,64 €**
RFTM-LQ-CO2-W			(switchable)				
RFTM-LQ-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W	1501-61B8-7301-500	**424,04 €**
RFTM-LQ-CO2-W **LCD**	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B8-7321-500	**475,37 €**
Outputs:	**0-10 V or 4...20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* room sensor **RTM-CO2-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* room sensor **RTM-CO2-SD** without changeover contact!						
Note:	This unit **must not** be used as safety-relevant device!						

AERASGARD® RPS-SD
AERASGARD® RFTM-PS-CO2-W

**Fine dust sensor / particulate sensor,
multifunctional room sensor and measuring transducer
for humidity, temperature, fine dust (PM) and CO2 content,
calibratable, with active / switching output**

S+S REGELTECHNIK

Maintenance-free room sensor **AER**ASGARD® **RPS-SD** with active output, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, for detecting the fine dust content (0...500 µg/m³).
The measuring transducer converts the measurand into a standard signal of 0-10 V (fixed).

Maintenance-free, multifunctional room sensor **AER**ASGARD® **RFTM-PS-CO2-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with/without display, for detection of measurands air humidity (0...100 % RH), temperature (0...+50°C), fine dust (PM) (0...50 / 100 / 300 / 500 µg/m³) and CO2 content (0...2000 / 5000 ppm). The measuring transducer converts the measurand into a standard signal of 0-10 V or 4...20 mA (switchable).

Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

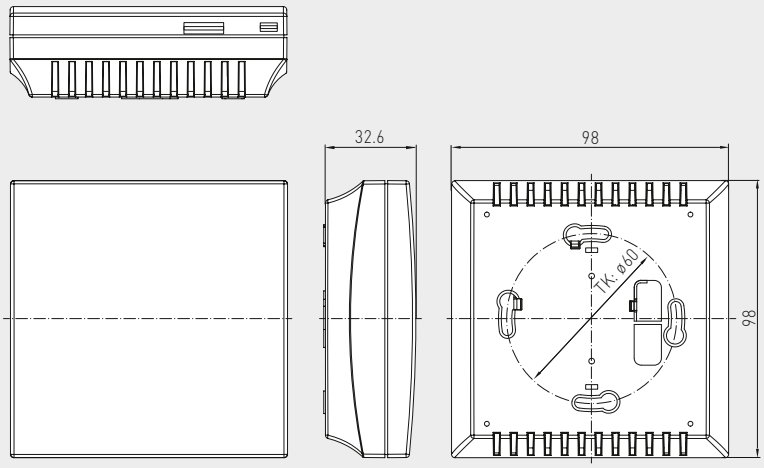
A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results.
The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology).
An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.
The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible (except for particulate sensor).

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)	
Power consumption:	**RPS-SD**	typically < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
	RFTM-PS-CO2-W	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
Output:	**RPS-SD**	0-10 V (fixed)
	RFTM-PS-CO2-W	0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected version applies **uniformly** to all outputs), with offset potentiometer (± 10 % of measuring range)
Relay output:	**RPS-SD**	without changeover contact
	RFTM-PS-CO2-W	with potential-free **changeover contact** (24 V / 1 A) (assignment selectable via DIP switches, switch point can be set)
HUMIDITY		
Sensor (RH / °C):	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability	
Measuring range (RH):	0...100 % RH	
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)	
Deviation (RH):	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %	
TEMPERATURE		
Measuring range (°C):	0...+ 50 °C	
Output (°C):	0-10 V or 4...20 mA (selectable via DIP switches)	
Deviation (°C):	typically ± 0.2 K at +25 °C	
FINE DUST (PM)		
Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology	
Measuring range (PM):	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m³	
Output (PM):	**RPS-SD**	0-10 V (fixed)
	RFTM-PS-CO2-W	0-10 V or 4...20 mA (selectable via DIP switches)
Particle size (PM):	**PM 2.5** (0.3...2.5 µm); **PM 10** (0.3...10 µm)	
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10	
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)	
Service life (PM):	> 10 years	
CARBON DIOXIDE (CO2)		
Sensor (CO2):	Optical **NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button), with automatic calibration (can be deactivated via DIP switches)	
Measuring range (CO2):	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)	
Output (CO2):	0-10 V or 4...20 mA (selectable via DIP switches)	
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)	
Temperature dependence (CO2):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is greater)	
Pressure dependence (CO2):	± 0.13 % / mm Hg	
Long-term stability (CO2):	< 2 % in 15 years	
Gas exchange (CO2):	Diffusion	Continued on next page!

Dimensional drawing

RPS-SD
RFTM-PS-CO2-W



RPS-SD
RFTM-PS-CO2-W
without display





RFTM-PS-CO2-W
with display



TECHNICAL DATA (continued)

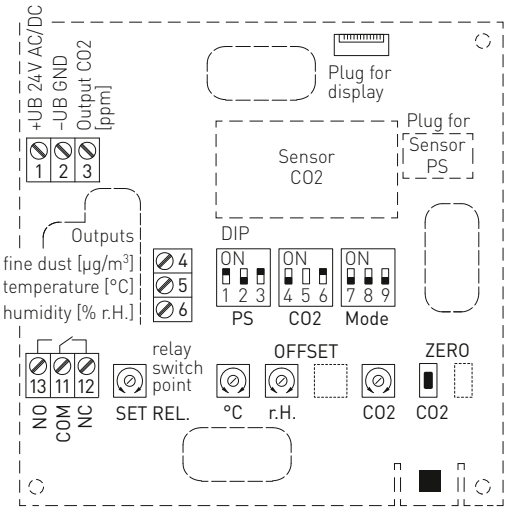
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
IP rating:	**IP 30** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	**Display with illumination,** 2-line, cutout approx. 36 x 15 mm (W x H), to display the actual humidity, actual temperature, of the fine-dust and CO2 content as well as for switch point display

AERASGARD® RPS-SD
AERASGARD® RFTM-PS-CO2-W

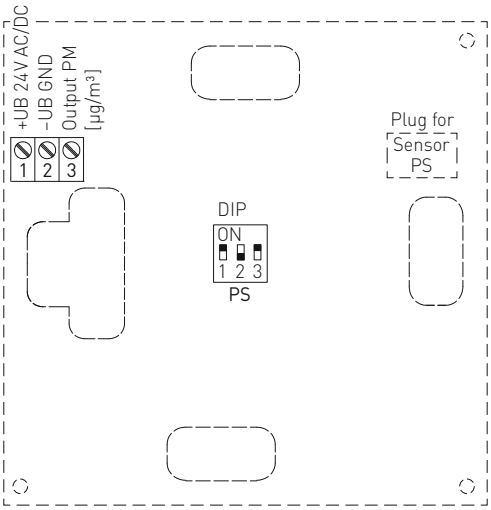
Fine dust sensor/particulate sensor, multifunctional room sensor and measuring transducer for humidity, temperature, fine dust (PM) and CO2 content, calibratable, with active/switching output

S+S REGELTECHNIK

Schematic diagram **RFTM-PS-CO2-W**

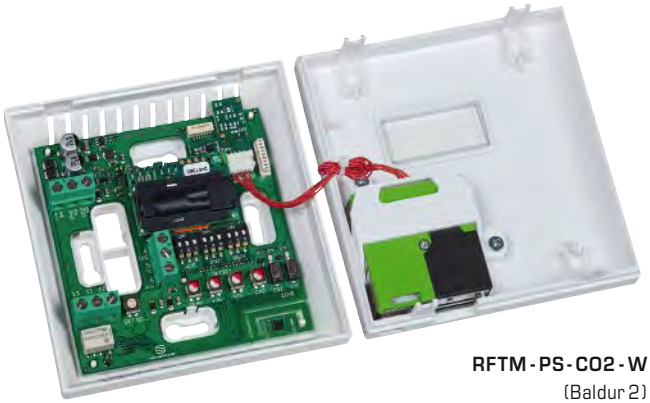


Schematic diagram **RPS-SD**



DIP switch	RFTM-PS-xx	
Fine dust (PM) Measuring range	**DIP 1**	**DIP 2**
0…50 µg/m³	OFF	OFF
0…100 µg/m³ (default)	**ON**	OFF
0…300 µg/m³	OFF	**ON**
0…500 µg/m³	**ON**	**ON**
Fine dust (PM) Particle size		**DIP 3**
PM 2.5 (default)		**ON**
PM 10		OFF
CO2 content		**DIP 4**
0…2000 ppm (default)		OFF
0…5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default) 600…1900 ppm / 900…4700 ppm	OFF	OFF
Fine dust 10 %…95 % of measuring range	**ON**	OFF
Temperature +5…+48 °C	OFF	**ON**
Humidity 10…95 % RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4…20 mA		**ON**
Note: **DIP 5** is not assigned !		

DIP switch	RPS-SD	
Fine dust (PM) Measuring range	**DIP 1**	**DIP 2**
0…50 µg/m³	OFF	OFF
0…100 µg/m³ (default)	**ON**	OFF
0…300 µg/m³	OFF	**ON**
0…500 µg/m³	**ON**	**ON**
Fine dust (PM) Particle size		**DIP 3**
PM 2.5 (default)		**ON**
PM 10		OFF



RFTM-PS-CO2-W
(Baldur 2)

Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**50**	5.0	12.0
5	0.5	4.8	**55**	5.5	12.8
10	1.0	5.6	**60**	6.0	13.6
15	1.5	6.4	**65**	6.5	14.4
20	2.0	7.2	**70**	7.0	15.2
25	2.5	8.0	**75**	7.5	16.0
30	3.0	8.8	**80**	8.0	16.8
35	3.5	9.6	**85**	8.5	17.6
40	4.0	10.4	**90**	9.0	18.4
45	4.5	11.2	**95**	9.5	19.2
Continued at the right ...			**100**	10.0	20.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]	I_A [mA]
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD®

RPS-SD Room fine dust sensor / fine dust sensor / particulate sensor (PM), *Standard*

RFTM-PS-W Multifunctional room sensor
for humidity, temperature and fine dust (PM), *Premium*

RFTM-PS-CO2-W Multifunctional room sensor
for humidity, temperature, fine dust (PM) and CO2 content, *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature	PM	CO2	Equipment Display	Item No.	Price
RPS-SD			(switchable)				
RPS-SD	–	–	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–		1501-2110-1001-000	**316,30 €**
RFTM-PS-W			(switchable)	(switchable)			
RFTM-PS-W	0...100 % RH	0...+50 °C	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–	W	1501-2116-7301-000	**412,61 €**
RFTM-PS-W **LCD**	0...100 % RH	0...+50 °C	(4x as above)	–	W ■	1501-2116-7321-000	**501,29 €**
RFTM-PS-CO2-W							
RFTM-PS-CO2-W	0...100 % RH	0...+50 °C	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	0...2000 ppm / 0...5000 ppm	W	1501-2113-7301-000	**480,36 €**
RFTM-PS-CO2-W **LCD**	0...100 % RH	0...+50 °C	(4x as above)	0...2000 ppm / 0...5000 ppm	W ■	1501-2113-7321-000	**531,70 €**
Outputs:	**0-10 V or 4...20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* room sensor **RPS-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* room sensor **RPS-SD** without changeover contact!						
Note:	These units must **not** be used as safety-relevant devices!						

AERASGARD® FSCO2
AERASGARD® FSTM-CO2

Room CO2 and temperature sensor or measuring transducer, in-wall in the panel switch programme, with active output

S+S REGELTECHNIK

The room sensor **AER**ASGARD® **FSCO2 / FSTM-CO2** in the in-wall housing is used for measuring the CO2 content and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for temperature measurement.

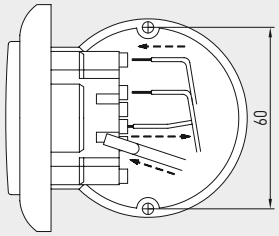
The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

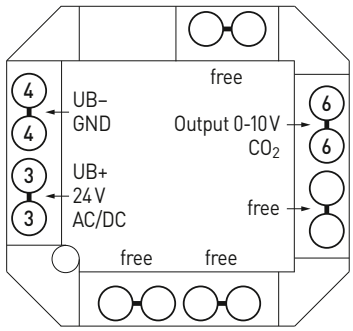
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
CARBON DIOXIDE (CO2)	
Sensor, CO2:	**optical NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration (fixed)
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...2000 ppm
Output, CO2:	0-10 V
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
TEMPERATURE	
Sensor:	**digital temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range:	0...+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0-2.5 mm², via plug terminals
Ambient temperature:	Storage –35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

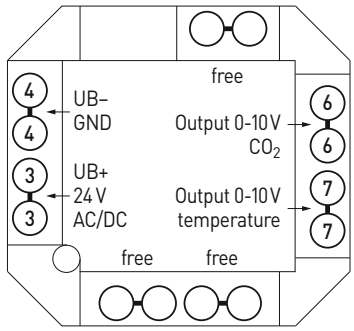
Mounting diagram **in-wall**



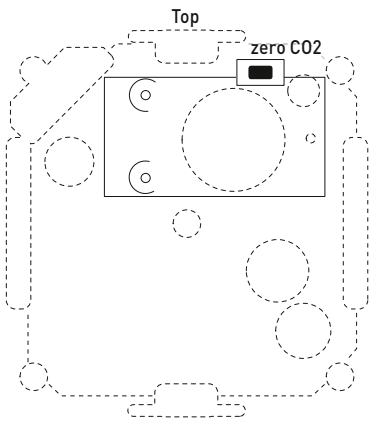
Connection diagram **FSCO2**



Connection diagram **FSTM-CO2**

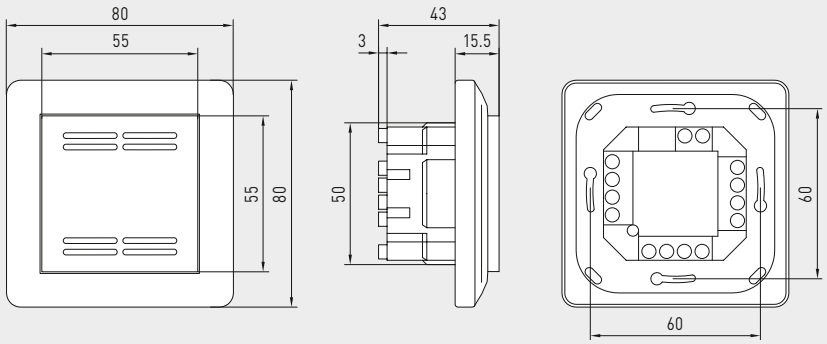


Schematic diagram **FSFTM-CO2**



Dimensional drawing

FSCO2
FSTM-CO2



FSCO2
FSTM-CO2



CO2 content table
MR: 0...2000 ppm

ppm	U_A [V]	ppm	U_A [V]
0	0.00	**1000**	5.0
350	1.75	**1100**	5.5
400	2.00	**1200**	6.0
450	2.25	**1300**	6.5
500	2.50	**1400**	7.0
550	2.75	**1500**	7.5
600	3.00	**1600**	8.0
700	3.50	**1700**	8.5
800	4.00	**1800**	9.0
900	4.50	**1900**	9.5
Continued to the right ...		**2000**	10.0

Temperature table
MR: 0...+50 °C

°C	U_A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

AERASGARD® FSCO2 Room CO2 sensor or measuring transducer, in-wall
AERASGARD® FSTM-CO2 Room temperature and CO2 sensor or measuring transducer, in-wall

Type / WG02	Measuring Range CO2	Measuring Range Temperature	Output CO2	Output Temperature	Item No.	Price
FSCO2						
FSCO2-U	0...2000 ppm	–	0-10 V	–	1501-9120-1001-162	**348,04 €**
FSTM-CO2						
FSTM-CO2-U	0...2000 ppm	0...+50 °C	0-10 V	0-10 V	1501-9122-1001-162	**352,92 €**

AERASGARD® FSLQ

Room air-quality sensors (VOC) or measuring transducers, in-wall in the panel switch programme, with active output

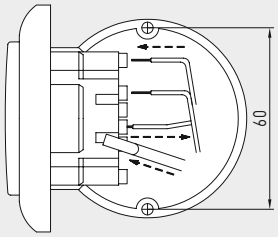
S+S REGELTECHNIK

Maintenance-free air-quality sensor **AER**ASGARD® **FSLQ** with active output, automatic calibration, in the in-wall housing, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured variables into a standard signal of 0-10 V. The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

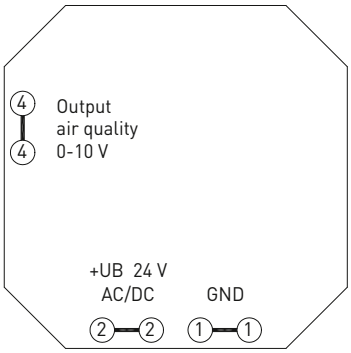
The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This determines the pollutant loading of the room air by contaminated gases such as cigarette smoke, body vapours, breathing air, solvent vapours, emissions, etc.

Mounting diagram [mm] **In-wall**



Schematic diagram **FSLQ-U**

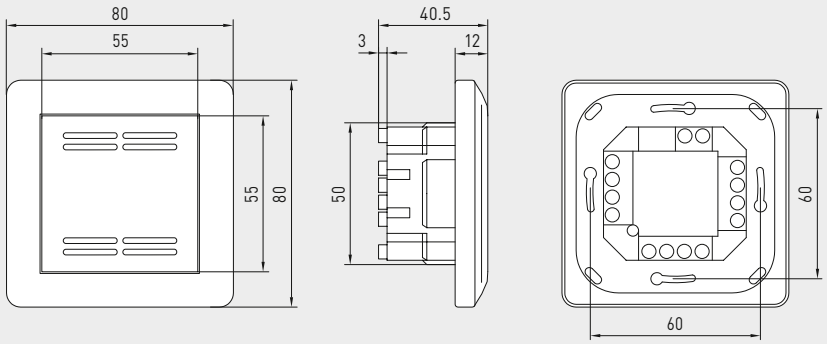


TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC
AIR QUALITY (VOC)	
Sensor:	VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds) Detection of the gases is not selective
Measuring range:	0…100 % air quality (with reference to the calibration gas)
Measuring accuracy:	typically ± 20 % final value (with reference to the calibration gas)
Service life:	> 60 months (under normal load conditions)
Warm-up time:	approx. 1 hour
Response time:	< 60 s
Output:	0 - 10 V (0 V = clean air, 10 V = polluted air) (low to elevated room air pollution load)
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage –20…+50 °C; Operation 0…+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Medium:	clean air and non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Dimensional drawing
[mm]

FSLQ



FSLQ



Table VOC content
MR: 0...100 %

VOC %	U_A [V]
0	0,0
5	0,5
10	1,0
15	1,5
20	2,0
25	2,5
30	3,0
35	3,5
40	4,0
45	4,5
50	5,0
55	5,5
60	6,0
65	6,5
70	7,0
75	7,5
80	8,0
85	8,5
90	9,0
95	9,5
100	10,0

AERASGARD® FSLQ	Room air quality sensor (VOC) or measuring transducer, in-wall			
Type / WG01	**Measuring range** VOC	**Output** VOC	**Item No.**	**Price**
FSLQ				
FSLQ-U	0...100 %	0-10 V	1501-5120-1000-162	**253,07 €**
Note:	This unit must **not** be used as a safety-relevant device!			

AERASGARD® ACO2-W
AERASGARD® ACO2-SD

On-wall CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Maintenance-free on-wall sensor **AER**ASGARD® **ACO2-SD** with active output, automatic calibration (fixed), in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free on-wall sensor **AER**ASGARD® **ACO2-W** with active/switching output, automatic calibration (can be deactivated), in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). he measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

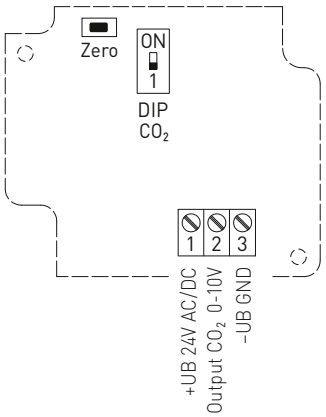
The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **ACO2-SD** with automatic calibration (fixed) **ACO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**Multi-range switching** (selectable via DIP switches) 0…2000 ppm; 0…5000 ppm
Output:	**ACO2-SD** 0-10 V (fixed) **ACO2-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**ACO2-SD** without changeover contact **ACO2-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	–10…+60 °C
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**with display** (see **AER**ASGARD® **AFTM-LQ-CO2**) for displaying the actual CO2 content in ppm
ACCESSORIES	see table

Schematic diagram **ACO2-SD**

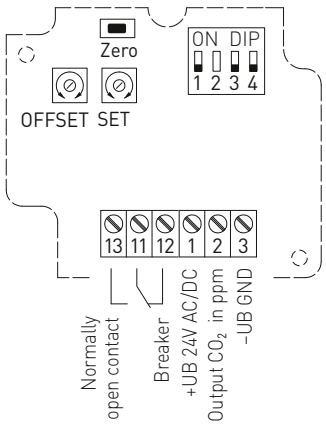


Connecting diagram **ACO2-SD**



UB+ 24V AC/DC
Output CO_2 0-10V in ppm
UB– GND

Schematic diagram **ACO2-W**



Connecting diagram **ACO2-W**



UB+ 24V AC/DC
Output CO_2 0-10V/4…20mA
UB– GND

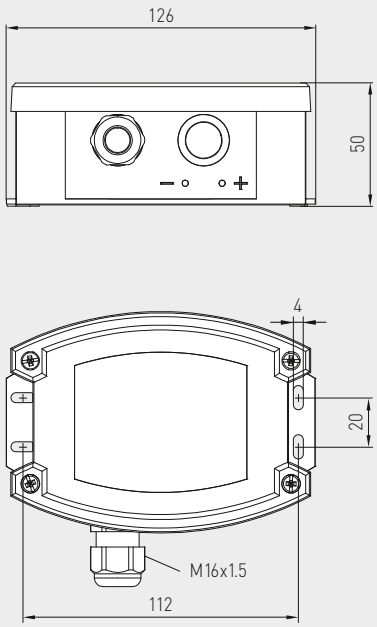
Breaker
Normally open contact
changeover 24V/1A

AERASGARD® ACO2 - W
AERASGARD® ACO2 - SD

On-wall CO2 sensor and measuring transducer, self-calibrating, with multi-range switching and active / switching output

Dimensional drawing

ACO2 - W
ACO2 - SD





M12 connector
(optional on request)

ACO2 - W
ACO2 - SD



WS-03
Weather and sun protection hood
(optional)



DIP switch	ACO2 - W
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Note: **DIP 2** is not assigned!	

DIP switch	ACO2 - SD
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

AERASGARD® ACO2 - SD On-wall CO2 sensor and measuring transducer, *Standard*
AERASGARD® ACO2 - W On-wall CO2 sensor and measuring transducer, *Premium*

Type / WG02B	Measuring Range CO2	Output CO2	Equipment	Display	Item No.	Price
ACO2 - SD	(switchable)	(fixed)				
ACO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-7110-1001-200	**252,15 €**
ACO2 - W	(switchable)	(switchable)				
ACO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-7110-7301-200	**361,77 €**
ACO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	see **AFTM-LQ-CO2**	
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)					
Note:	This unit **must not** be used as safety-relevant device!					

ACCESSORIES			
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
	For further information see last chapter!		

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Maintenance-free on-wall sensor **AER**ASGARD® **ATM-CO2-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm) and the temperature (–35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free on-wall sensor **AER**ASGARD® **AFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (–35...+80 °C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.

TECHNICAL DATA

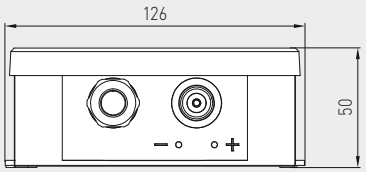
Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	**Axx-SD** 0-10 V (fixed) **Axx-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**Axx-SD** without changeover contact **Axx-W** with potential-free **changeover contact** (24 V / 1 A)
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation of humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0-10 V **or** 4...20 mA (selectable via DIP switches)
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Temperature deviation:	typically ± 0.4 K at 25 °C
Output, temperature:	**Axx-SD** 0-10 V (fixed) **Axx-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
AIR QUALITY (VOC)	
Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0 V = clean air, 10 V = polluted air) **or** 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy, VOC:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration
CARBON DIOXIDE (CO2)	
Sensor, CO2:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **Axx-SD** with automatic calibration (fixed) **Axx-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO2:	0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output, CO2:	**Axx-SD** 0-10 V (fixed) **Axx-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)

continued on next page!

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

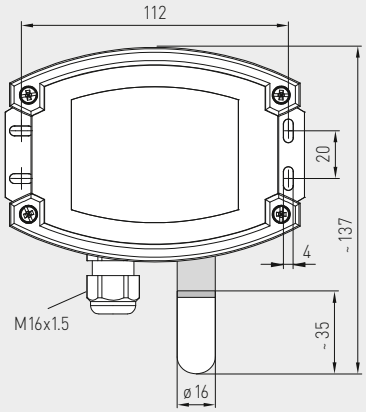
Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

Dimensional drawing — **AFTM-LQ-CO2-W**



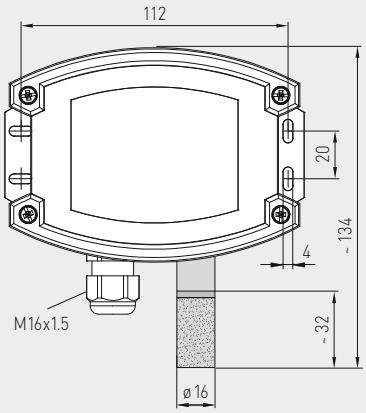
M12 connector
(optional on request)





SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



AFTM-LQ-CO2-W
with plastic sinter filter
(standard)



AFTM-LQ-CO2-W
with display and
plastic sinter filter
(standard)



TECHNICAL DATA (continued)

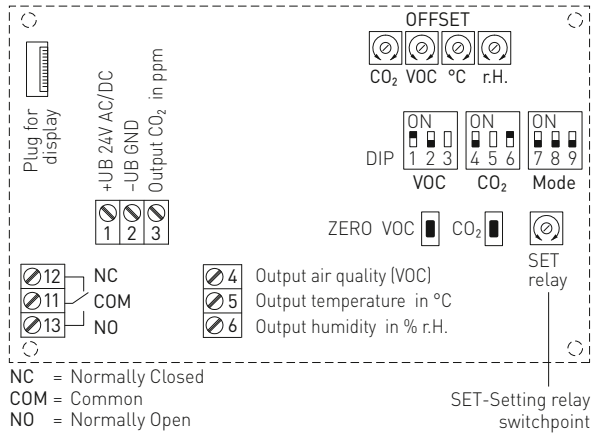
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	–10...+60 °C
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and / or the actual CO2 content

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

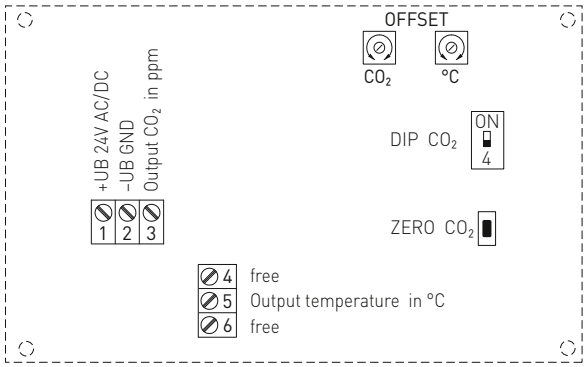
Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Schematic diagram **AFTM-LQ-CO2-W**



Schematic diagram **ATM-CO2-SD**



DIP switches	AFTM-LQ-CO2-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
CO2 content		**DIP 4**
0...2000 ppm (default)		OFF
0...5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	**ON**	OFF
Temperature: –23...+74 °C	OFF	**ON**
Humidity: 10...95% RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** and **DIP 5** are not assigned!		

DIP switches	ATM-CO2-SD
CO2 content	**DIP 4**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990–1005)

AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

AFTM-LQ-CO2-W
with display



Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]	% RH	U_A [V]	I_A [mA]
0	0	4.0	**60**	6.0	13.6
5	0.5	4.8	**65**	6.5	14.4
10	1.0	5.6	**70**	7.0	15.2
15	1.5	6.4	**75**	7.5	16.0
20	2.0	7.2	**80**	8.0	16.8
25	2.5	8.0	**85**	8.5	17.6
30	3.0	8.8	**90**	9.0	18.4
35	3.5	9.6	**95**	9.5	19.2
40	4.0	10.4	**100**	10.0	20.0
45	4.5	11.2			
50	5.0	12.0			
55	5.5	12.8			

Continued at the right ...

Temperature table
MR: –35...+80 °C

°C	U_A [V]	I_A [mA]	°C	U_A [V]	I_A [mA]
–35	0.0	4.0	**+25**	5.2	12.3
–30	0.4	4.7	**+30**	5.7	13.0
–25	0.9	5.4	**+35**	6.1	13.7
–20	1.3	6.1	**+40**	6.5	14.4
–15	1.7	6.8	**+45**	7.0	15.1
–10	2.2	7.5	**+50**	7.4	15.8
–5	2.6	8.2	**+55**	7.8	16.5
0	3.0	8.9	**+60**	8.3	17.2
+5	3.5	9.6	**+65**	8.7	17.9
+10	3.9	10.3	**+70**	9.1	18.6
+15	4.3	11.0	**+75**	9.6	19.3
+20	4.8	11.7	**+80**	10.0	20.0

Continued at the right ...

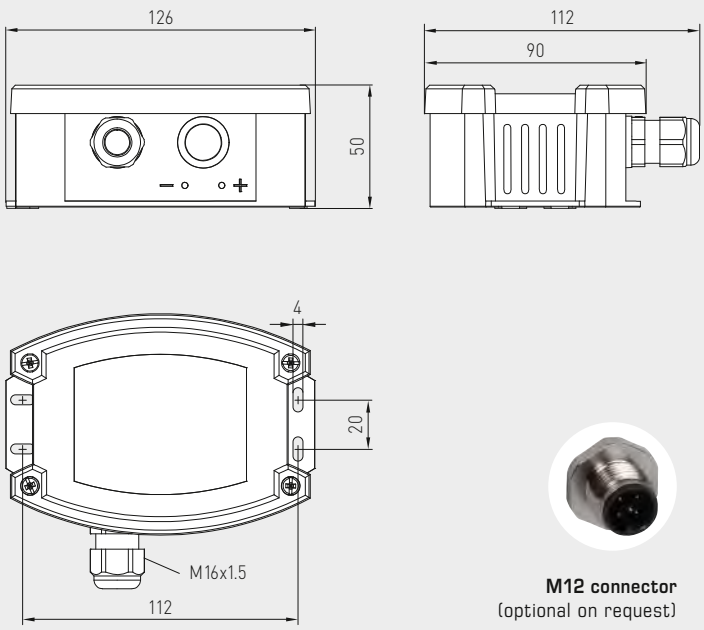
AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Dimensional drawing

ACO2-W
ALQ-CO2-W



M12 connector
(optional on request)

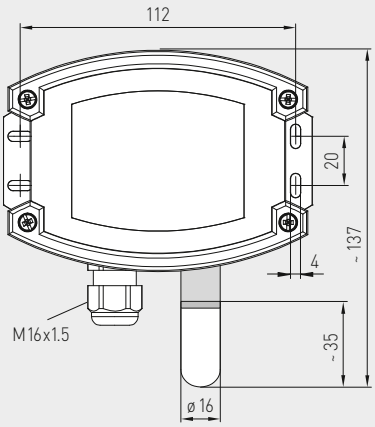
ACO2-W
ALQ-CO2-W





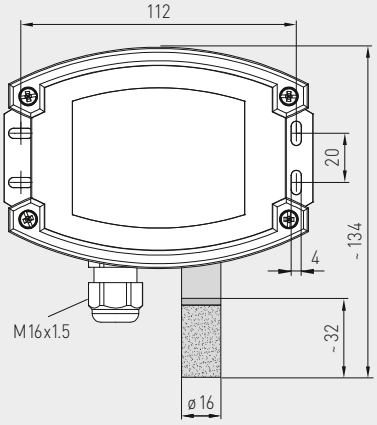
Dimensional drawing

AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD



SF-K
plastic sinter filter
(standard)





SF-M
metal sinter filter
(optional)



AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD
with metal sinter filter
(optional)





AERASGARD® ACO2-W / ALQ-CO2-W
AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

WS-03
Weather and sun protection hood (optional)



AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD
with plastic sinter filter (standard)



AERASGARD® **ATM-CO2-SD**	On-wall temperature and CO2 sensor, *Standard*
AERASGARD® **ACO2-W**	On-wall CO2 sensor, *Premium*
AERASGARD® **ALQ-CO2-W**	On-wall air quality (VOC) and CO2 sensor, *Premium*
AERASGARD® **AFTM-CO2-W**	Multifunctional on-wall sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® **AFTM-LQ-CO2-W**	Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), *Deluxe*

Typ / WG02	Measuring Range Humidity	Temperature	CO2	VOC	Equipment Display	Item No. (Baldur 2)	Price
ATM-CO2-SD			(switchable)				
ATM-CO2-SD-U	–	–35…+80 °C	0…2000 / 5000 ppm	–	–	1501-7112-1001-200	**320,98 €**
ACO2-W			(switchable)				
ACO2-W (without display)	–	–	0…2000 / 5000 ppm	–	W	see **ACO2-W / ACO2-SD**	
ACO2-W **LCD**	–	–	0…2000 / 5000 ppm	–	W ■	1501-7110-7371-200	**423,79 €**
ALQ-CO2-W			(switchable)				
ALQ-CO2-W	–	–	0…2000 / 5000 ppm	0…100 %	W	1501-7111-7301-500	**482,51 €**
ALQ-CO2-W **LCD**	–	–	0…2000 / 5000 ppm	0…100 %	W ■	1501-7111-7371-500	**544,74 €**
AFTM-CO2-W			(switchable)				
AFTM-CO2-W	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	–	W	1501-7116-7301-200	**463,41 €**
AFTM-CO2-W **LCD**	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	–	W ■	1501-7116-7371-200	**556,09 €**
AFTM-LQ-CO2-W			(switchable)				
AFTM-LQ-CO2-W	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	0…100 %	W	1501-7118-7301-500	**606,86 €**
AFTM-LQ-CO2-W **LCD**	0…100 % RH	–35…+80 °C	0…2000 / 5000 ppm	0…100 %	W ■	1501-7118-7371-500	**726,42 €**
Outputs:	**0-10 V or 4…20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* on-wall sensor **ATM-CO2-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* on-wall sensor **ATM-CO2-SD** without changeover contact!						
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)						
Note:	This unit **must not** be used as safety-relevant device!						
ACCESSORIES							
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)					7000-0050-2200-100	**43,60 €**
WS-03	**Weather and sun protection hood**, 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)					7100-0040-6000-000	**46,08 €**
	For further information see last chapter!						

AERASGARD® APS-SD

Fine dust sensor / particulate sensor, on-wall sensor and measuring transducer, with multi-range switching and active output

S+S REGELTECHNIK

Maintenance-free on-wall sensor **AER**ASGARD® **APS-SD** with active output, in an impact-resistant plastic housing with quick-locking screws, for measuring the fine-dust content (0...500 µg /m³).
The measuring transducer converts the measured values into a standard signal of 0-10 V.

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluation of the indoor climate. This enables energy-saving, demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

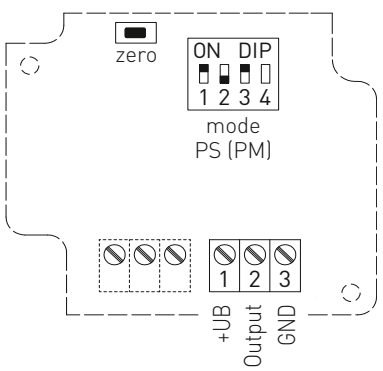
An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres. The sensor is factory-calibrated.

TECHNICAL DATA

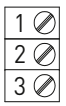
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typical < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
Output:	0-10 V (fixed)
FINE DUST (PM)	
Sensor (PM):	optical **particulate sensor** (**PM** = particulate matter), **fine-dust sensor** with laser- and soiling-resistant technology
Measuring range:	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m³
Particle size:	**PM 2.5** (0.3...2.5 µm); **PM 10** (0.3...10 µm)
Measuring accuracy:	typical ± 10 µg/m³ (± 10% of the measured value) for PM 2.5 typical ± 25 µg/m³ (± 25% of the measured value) for PM 10
Long-term stability:	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life:	> 10 years
Response time:	< 2 minutes
Warm-up time:	approx. 1 hour
Ambient temperature:	0...+ 50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination) colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	**cable gland** plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14–1.5 mm², via screw terminals
Process connection:	via screws
Protection class:	III (according to EN 60 730)
Safety class:	**IP 30** (according to EN 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU

DIP switch	APS-SD	
Fine dust (PM) Measuring range	**DIP 1**	**DIP 2**
0...50 µg/m³	OFF	OFF
0...100 µg/m³ (default)	**ON**	OFF
0...300 µg/m³	OFF	**ON**
0...500 µg/m³	**ON**	**ON**
Fine dust (PM) Particle size		**DIP 3**
PM 2.5 (default)		**ON**
PM 10		OFF
Note: **DIP 4** is not assigned !		

Schematic diagram **APS-SD**



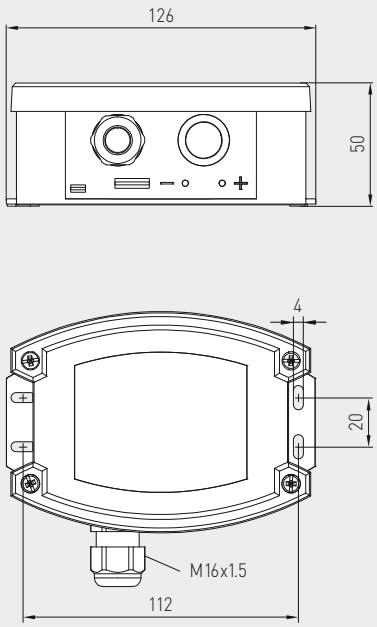
Connecting diagram **APS-SD**



UB+ 24V AC/DC
Output PM [µg/m³]
UB– GND

Fine dust sensor / particulate sensor, on-wall sensor and measuring transducer, with multi-range switching and active output

Dimensional drawing **APS-SD**





M12 connector
(optional on request)

APS-SD





AERASGARD® APS-SD	On-wall fine dust sensor / fine dust sensor / particulate sensor (PM), *Standard*				
Type / WG02	**Measuring Range**	**Particle size**	**Output**	**Item No.**	**Price**
APS-SD	(switchable)	(switchable)			
APS-SD-U	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	PM 2.5 PM 10	0-10 V	1501-7130-1001-000	**425,98 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 (on request)				
Note:	This unit **must not** be used as safety-relevant device!				

AERASGARD® KLQ-W
AERASGARD® KLQ-SD

Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KLQ-SD** with active output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KLQ-W** with active/switching output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0…100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

For more information, see the start of the chapter.



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	**VOC sensor** (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0…100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) **KLQ-SD** 0-10 V (fixed) **KLQ-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KLQ-SD** without changeover contact **KLQ-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Ambient temperature:	–10…+60 °C
Electrical connection:	0.14 - 1.5 mm², via terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm (optionally 100 mm), v_{max} = 30 m/s (air)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
ACCESSORIES	see last chapter

MFT-20-K
Mounting flange, plastic

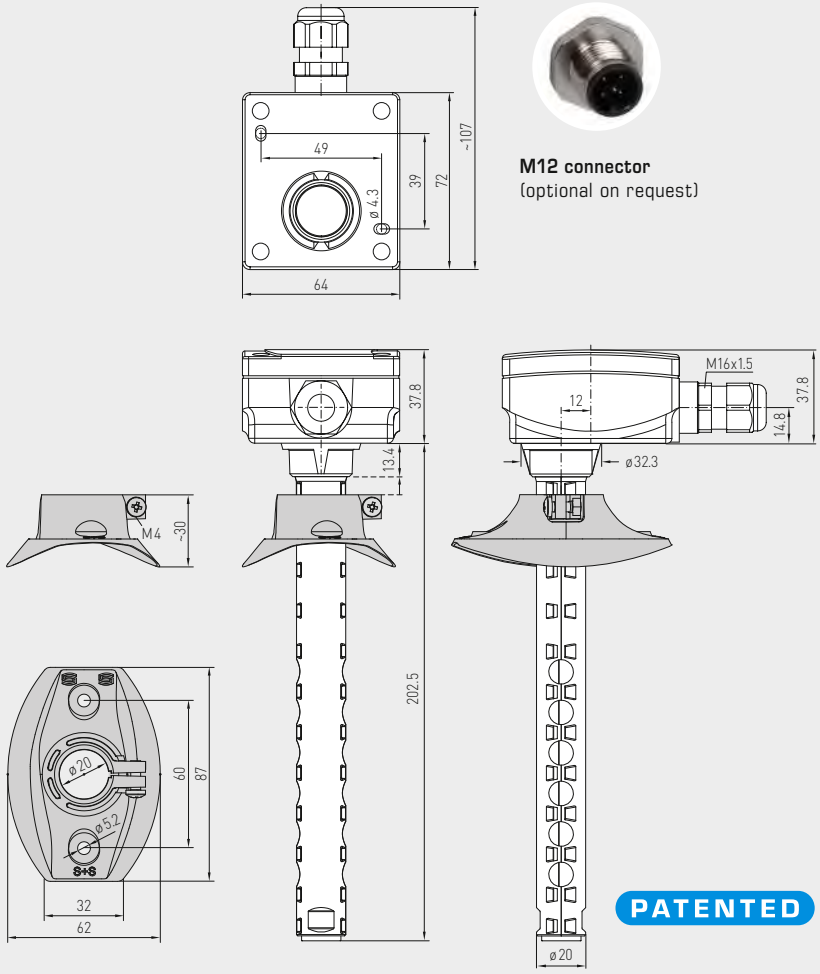


AERASGARD® KLQ-W
AERASGARD® KLQ-SD

Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

Dimensional drawing
[mm]

KLQ-W
KLQ-SD



M12 connector
(optional on request)

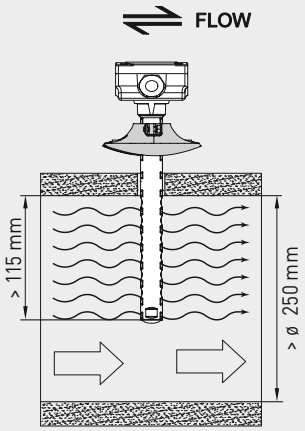
KLQ-W
KLQ-SD
with quick-locking screws (IP65)



PATENTED

Mounting diagram

KLQ-W
KLQ-SD

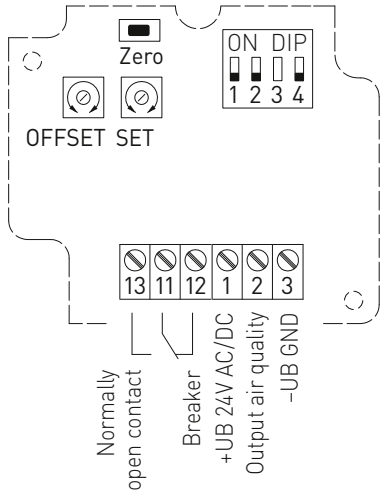


AERASGARD® KLQ-W
AERASGARD® KLQ-SD

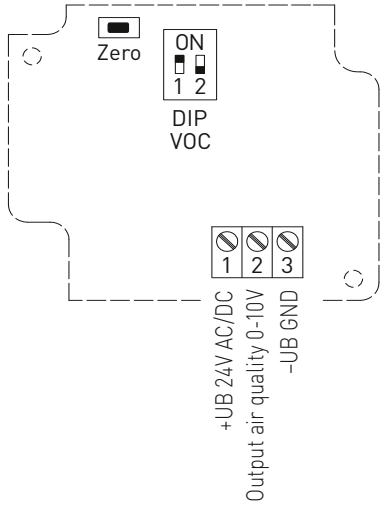
Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

S+S REGELTECHNIK

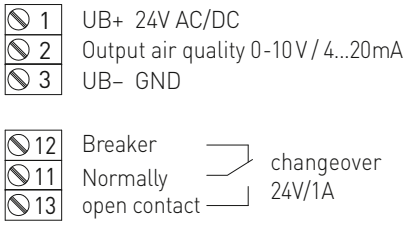
Schematic diagram **KLQ-W**



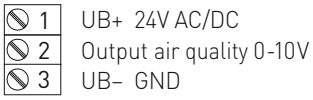
Schematic diagram **KLQ-SD**



Connecting diagram **KLQ-W**



Connecting diagram **KLQ-SD**



DIP switches	KLQ-W	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
Output		**DIP 4**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** is not assigned!		

DIP switches	KLQ-SD	
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)

AERASGARD® KLQ-W
AERASGARD® KLQ-SD

Duct air quality sensors (VOC) and measuring transducers, including installation flange, self-calibrating, with multi-range switching and active/switching output

KLQ-W
Circuit board



AERASGARD® KLQ-SD Duct air quality sensor and measuring transducer, *Standard*
AERASGARD® KLQ-W Duct air quality sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
KLQ-SD		(fixed)		**IP 65**	
KLQ-SD-U	0...100 %	0-10 V	–	1501-3170-1001-500	**218,89 €**
KLQ-W		(switchable)		**IP 65**	
KLQ-W	0...100 %	0-10 V / 4...20 mA	changeover contact	1501-3150-7301-500	**228,48 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm			on request on request	
Note:	This unit **must not** be used as safety-relevant device!				

AERASGARD® KCO2-W
AERASGARD® KCO2-SD

Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KCO2-SD** with active output, automatic calibration (fixed), in a compact plastic housing with quick-locking screws, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KCO2-W** with active/switching output, automatic calibration (can be deactivated), in a compact plastic housing with quick-locking screws, optionally with/without display, for determining the CO2 content of the air (0…2000 ppm/0…5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4…20 mA (switchable).

The CO2 sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

For more information, see the start of the chapter.

TECHNICAL DATA	
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; Peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), **KCO2-SD** with automatic calibration (fixed) **KCO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**Multi-range switching** (selectable via DIP switches) 0…2000 ppm; 0…5000 ppm
Output:	**KCO2-SD** 0-10 V (fixed) **KCO2-W** 0-10 V **or** 4…20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KCO2-SD** without changeover contact **KCO2-W** with potential-free **changeover contact** (24 V / 1 A), switchpoint adjustable
Measuring accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	–10…+60 °C
Response time:	approx. 1 minute, minimum flow rate 0.3 m / s (air)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM™**, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, (optionally 100 mm), v_{max} = 30 m/s (air)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**display with illumination,** two line, cutout approx. 36 x 15 mm (W x H), for displaying the **Actual CO2 content** and for setting the **switchpoint**
ACCESSORIES	see last chapter

MFT-20-K
Mounting flange, plastic

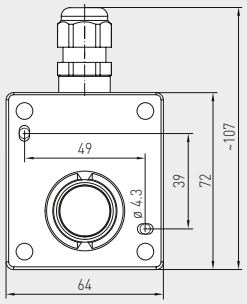


AERASGARD® KCO2-W
AERASGARD® KCO2-SD

Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

Dimensional drawing
[mm]

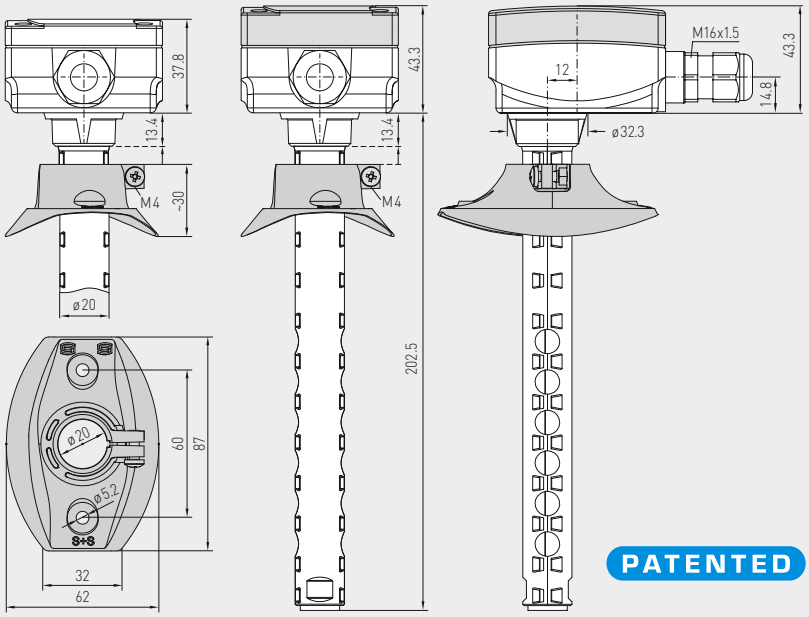
KCO2-W
KCO2-SD





M12 connector
(optional on request)

without display **with display**



PATENTED

KCO2-W
KCO2-SD
with quick-locking screws (IP65)

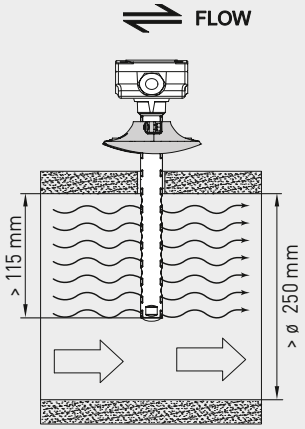


KCO2-W
with quick-locking screws and display (IP65)



Mounting diagram

KCO2-W
KCO2-SD

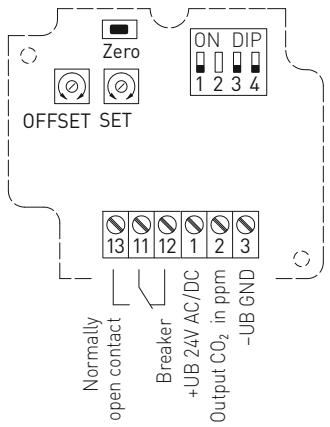


AERASGARD® KCO2-W
AERASGARD® KCO2-SD

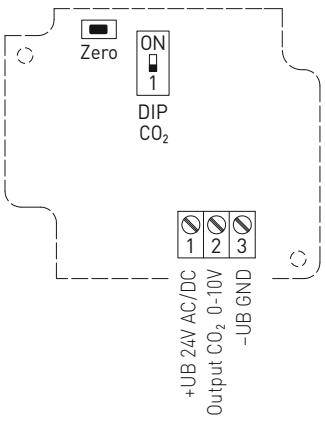
Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

S+S REGELTECHNIK

Schematic diagram **KCO2-W**



Schematic diagram **KCO2-SD**



Connecting diagram **KCO2-W**

1	UB+ 24V AC/DC
2	Output CO_2 0-10V/4...20mA
3	UB– GND

12	Breaker	changeover 24V/1A
11	Normally open contact	
13		

Connecting diagram **KCO2-SD**

1	UB+ 24V AC/DC
2	Output CO_2 0-10V in ppm
3	UB– GND

DIP switch	KCO2-W
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**
CO2 automatic zero point	**DIP 3**
deactivated	OFF
activated (default)	**ON**
Output	**DIP 4**
Voltage 0-10 V (default)	OFF
Current 4...20 mA	**ON**
Note: **DIP 2** is not assigned!	

DIP switch	KCO2-SD
CO2 content	**DIP 1**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

AERASGARD® KCO2-W
AERASGARD® KCO2-SD

Duct CO2 sensors and measuring transducers, incl. mounting flange, self-calibrating, with multi-range switching and active / switching output

KCO2-W
with display



AERASGARD® KCO2-SD Duct CO2 sensors and measuring transducers, *Standard*
AERASGARD® KCO2-W Duct CO2 sensors and measuring transducers, *Premium*

Type / WG02	Measuring Range CO2	Output CO2	Equipment	Display	Item No.	Price
KCO2-SD	(switchable)	(fixed)			**IP 65**	
KCO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-3160-1001-200	**246,49 €**
KCO2-W	(switchable)	(switchable)			**IP 65**	
KCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-3140-7301-200	**299,49 €**
KCO2-W **LCD**	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	1501-3140-7321-200	**351,18 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101 shortened protective tube **PLEUROFORM**™, NL = 100 mm				on request on request	
Note:	This unit **must not** be used as safety-relevant device!					

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AER**ASGARD® **KTM-CO2-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm) and the temperature (–35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AER**ASGARD® **KFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (–35...+80 °C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	**KTM-CO2-SD** 0-10 V (fixed) **Kxx-CO2-W** 0-10 V **or** 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	**KTM-CO2-SD** without changeover contact **Kxx-CO2-W** with potential-free **changeover contact** (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)
HUMIDITY	
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Deviation of humidity:	typically **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0-10 V **or** 4...20 mA (selectable via DIP switches)
TEMPERATURE	
Measuring range, temperature:	–35...+80 °C
Operating range, temperature:	–10...+60 °C
Temperature deviation:	typically ± 0.2 K at +25 °C
Output, temperature:	**KTM-CO2-SD** 0-10 V (fixed) **Kxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
AIR QUALITY (VOC)	
Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0 V = clean air, 10 V = polluted air) **or** 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy, VOC:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration
CARBON DIOXIDE (CO2)	
Sensor, CO2:	**optical NDIR sensor** (non-dispersive infra-red technology), with manual calibration (via zero button), **KTM-CO2-SD** with automatic calibration (fixed) **Kxx-CO2-W** with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO2:	0...2000 ppm **or** 0...5000 ppm (selectable via DIP switches)
Output, CO2:	**KTM-CO2-SD** 0-10 V (fixed) **Kxx-CO2-W** 0-10 V **or** 4...20 mA (selectable via DIP switches)
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is higher)

continued on next page!

SF-K
Plastic sinter filter (standard)



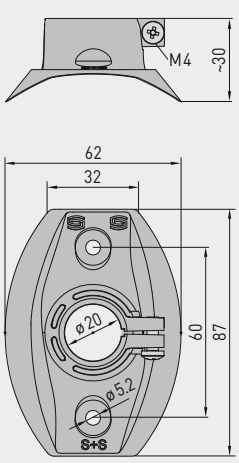
SF-M
Metal sinter filter (optional)



MFT-20-K
Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**

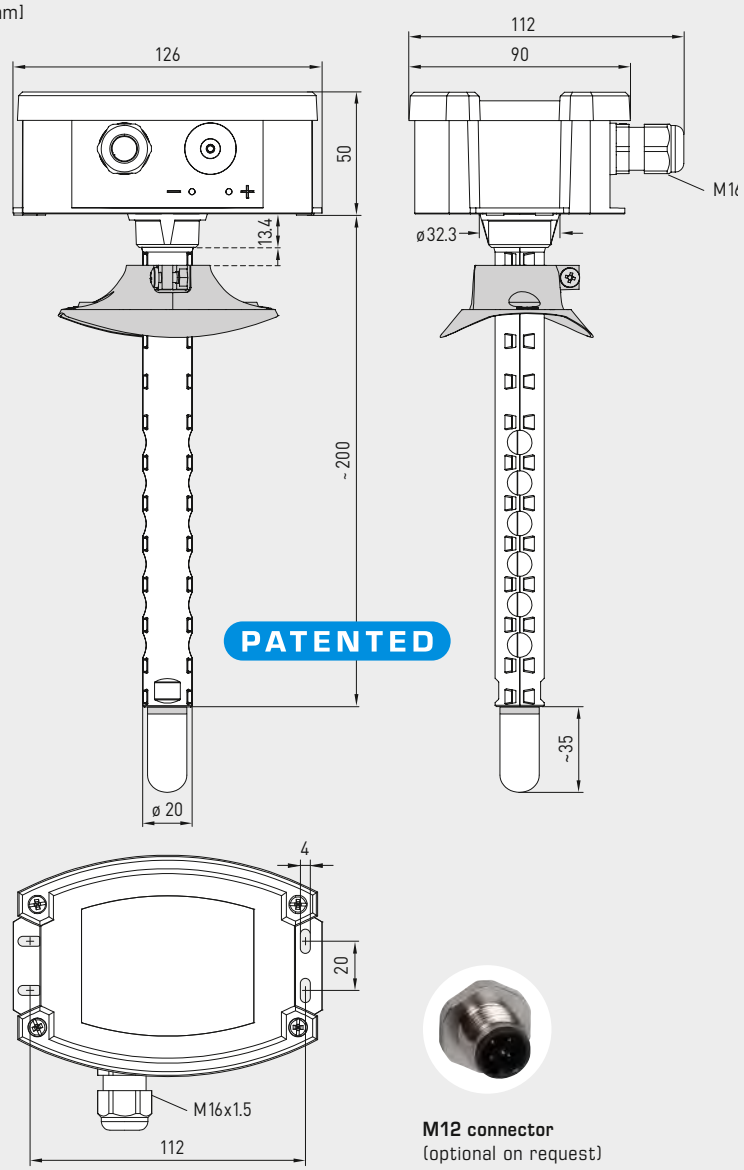


AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

Dimensional drawing
[mm]

KFTM-LQ-CO2-W



M12 connector
(optional on request)

KFTM-LQ-CO2-W
with plastic sinter filter
(standard)



KFTM-LQ-CO2-W
with display and
plastic sinter filter
(standard)



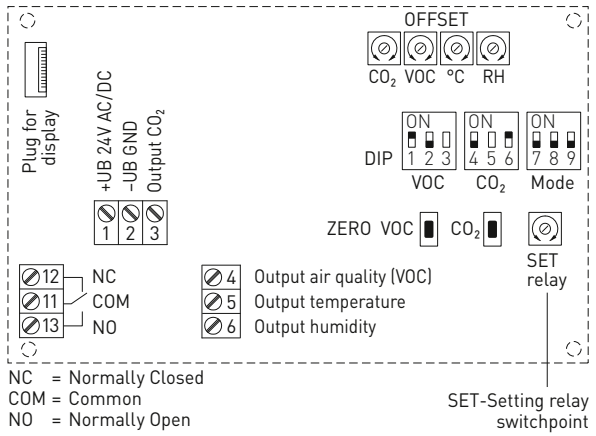
TECHNICAL DATA	(continued)
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Response time:	< 2 minutes, minimum flow rate 0.3 m/s (air)
Ambient temperature:	–10...+60 °C
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Cable connection:	**cable gland**, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016),,housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, v_{max} = 30 m/s (air) Ø 20 mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	three-line **display with illumination,** cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and / or the actual CO2 content

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

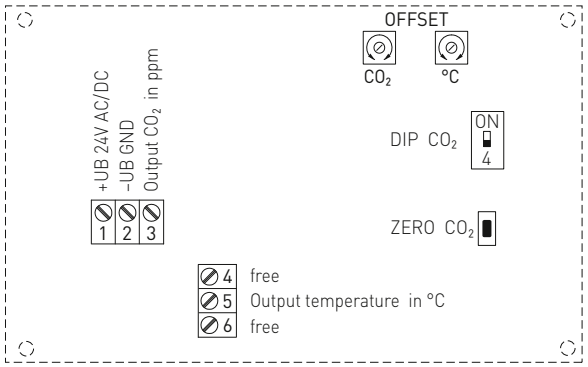
Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

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Schematic diagram **KFTM-LQ-CO2-W**



Schematic diagram **KTM-CO2-SD**



DIP switches KFTM-LQ-CO2-W		
VOC sensitivity	**DIP 1**	**DIP 2**
LOW	OFF	OFF
MEDIUM (default)	**ON**	OFF
HIGH	OFF	**ON**
IAQ (Indoor Air Quality)	**ON**	**ON**
CO2 content		**DIP 4**
0...2000 ppm (default)		OFF
0...5000 ppm		**ON**
CO2 automatic zero point		**DIP 6**
deactivated		OFF
activated (default)		**ON**
Relay assignment	**DIP 7**	**DIP 8**
CO2 (default): 600...1900 ppm / 900...4700 ppm	OFF	OFF
VOC: 10...95 %	**ON**	OFF
Temperature: –23...+74 °C	OFF	**ON**
Humidity: 10...95% RH	**ON**	**ON**
Output		**DIP 9**
Voltage 0-10 V (default)		OFF
Current 4...20 mA		**ON**
Note: **DIP 3** and **DIP 5** are not assigned!		

DIP switches KTM-CO2-SD	
CO2 content	**DIP 4**
0...2000 ppm (default)	OFF
0...5000 ppm	**ON**

Level	IAQ (Indoor Air Quality)	VOC
1	**excellent** no action required	**0**...**19** %
2	**good** prompt airing recommended	**20**...**39** %
3	**moderate** airing recommended	**40**...**59** %
4	**poor** increased airing required	**60**...**79** %
5	**unhealthy** intense airing necessary	**80**...**100** %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990–1005)

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

KFTM-LQ-CO2-W
with display







Humidity table
MR: 0...100 % RH

% RH	U_A [V]	I_A [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8

Continued at the right ...

% RH	U_A [V]	I_A [mA]
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table
MR: –35...+80 °C

°C	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.4	4.7
-25	0.9	5.4
-20	1.3	6.1
-15	1.7	6.8
-10	2.2	7.5
-5	2.6	8.2
0	3.0	8.9
+5	3.5	9.6
+10	3.9	10.3
+15	4.3	11.0
+20	4.8	11.7

Continued at the right ...

°C	U_A [V]	I_A [mA]
+25	5.2	12.3
+30	5.7	13.0
+35	6.1	13.7
+40	6.5	14.4
+45	7.0	15.1
+50	7.4	15.8
+55	7.8	16.5
+60	8.3	17.2
+65	8.7	17.9
+70	9.1	18.6
+75	9.6	19.3
+80	10.0	20.0

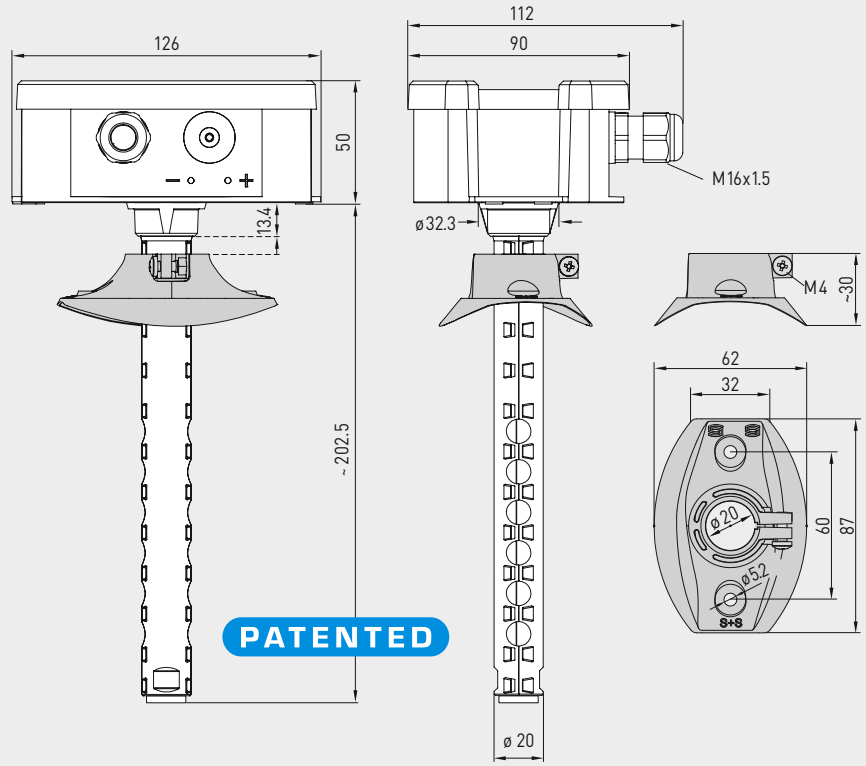
AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

S+S REGELTECHNIK

Dimensional drawing
[mm]

KLQ-CO2-W

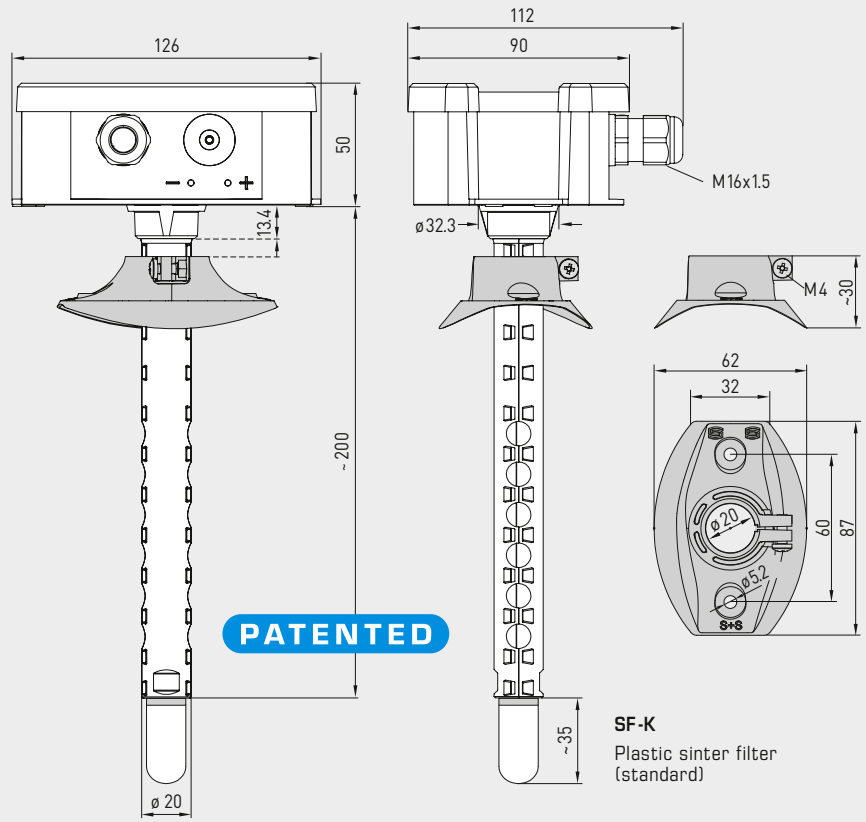


KLQ-CO2-W



Dimensional drawing
[mm]

KFTM-CO2-W
KFTM-LQ-CO2-W
KTM-CO2-SD



SF-K
Plastic sinter filter
(standard)

KFTM-CO2-W
KFTM-LQ-CO2-W
KTM-CO2-SD

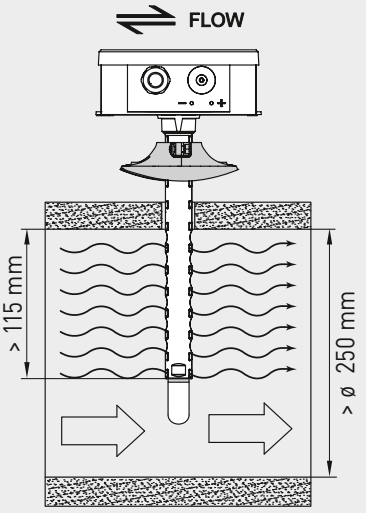


SF-M
Metal sinter filter
(optional)

AERASGARD® KLQ-CO2-W
AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output

Mounting diagram — **KLQ-CO2-W**, **KFTM-LQ-CO2-W**, **KTM-CO2-SD**



AERASGARD® **KTM-CO2-SD**	Duct sensor for temperature and CO2 content, *Standard*
AERASGARD® **KLQ-CO2-W**	Duct sensor for air quality (VOC) and CO2 content, *Premium*
AERASGARD® **KFTM-CO2-W**	Multifunctional duct sensor for humidity, temperature and CO2 content, *Deluxe*
AERASGARD® **KFTM-LQ-CO2-W**	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, *Deluxe*

Type / WG02	Measuring Range Humidity	Temperature	CO2	VOC	Equipment Display	Item No.	Price
KTM-CO2-SD			(switchable)				
KTM-CO2-SD-U	–	–35...+80 °C	0...2000 / 5000 ppm	–	–	1501-8112-1001-200	**314,14 €**
KLQ-CO2-W			(switchable)				
KLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-8111-7301-500	**402,07 €**
KLQ-CO2-W **LCD**	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-8111-7371-500	**462,83 €**
KFTM-CO2-W			(switchable)				
KFTM-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W	1501-8116-7301-200	**384,18 €**
KFTM-CO2-W **LCD**	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W ■	1501-8116-7371-200	**421,12 €**
KFTM-LQ-CO2-W			(switchable)				
KFTM-LQ-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W	1501-8118-7301-500	**481,88 €**
KFTM-LQ-CO2-W **LCD**	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-8118-7371-500	**542,65 €**
Outputs:	**0-10 V or 4...20 mA** (selectable via DIP switches, selected variant applies for all outputs) – *Standard* duct sensor **KTM-CO2-SD** with fixed output 0-10 V!						
Equipment:	**W = changeover contact** – *Standard* duct sensor **KTM-CO2-SD** without changeover contact!						
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101					on request	
	shortened protective tube **PLEUROFORM**™, NL = 100 mm					on request	
Note:	This unit **must not** be used as safety-relevant device!						

ACCESSORIES			
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel **V4A** (1.4404)	7000-0050-2200-100	**43,60 €**

AERASGARD® RPCO2
AERASGARD® RPCO2 - W

Room pendulum CO2 sensor or measuring transducer, self-calibrating, with multi-range switching and active / switching output

NEW

S+S REGELTECHNIK

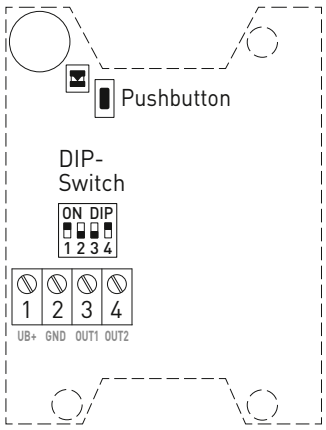
Maintenance-free room pendulum sensor **AER**ASGARD® **RPCO2** with active output and **RPCO2-W** with active/switching output, automatic calibration (can be deactivated via DIP) and manual calibration (via push-button), in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, for determining the CO2 content in the air (0 to 2000 / 5000 / 10000 ppm).
The measuring transducer converts the measurand into a standard signal of 0-10 V (output 1) and 4...20 mA (output 2).

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The sensor is simply suspended into the room as a pendulum, which ensures an accurate measurement result in rooms with high walls. The zero point calibration (400 ppm CO2) can be carried out in relation to the current ambient conditions by manual calibration on the unit. The air quality sensor performs an automatic self-calibration at regular intervals, which ensures CO2 measurement with long-term stability. The sensor is used in ventilation and air conditioning technology, ventilation monitoring, filter monitoring, level measurement.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %), half-wave rectifier, read the instructions!
Power consumption:	Ø 100 mA, peak current up to 300 mA
Switching type:	3-wire connection
Output 1 (CO2):	**0-10 V**
Output 2 (CO2):	**4...20 mA**
Relay output:	**RPCO2** without changeover contact **RPCO2-W** with potential-free **changeover contact** (max. 48 V / 1 A), switch point can be set
Sensor:	Optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero push-button), with automatic calibration (can be deactivated via DIP switches)
Measuring range:	**Multi-range switching** (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm; 0...10000 ppm (other measuring ranges optionally available upon request)
Measuring accuracy:	typically ± 75 ppm ± 5 % of measured value up to 5000 ppm, otherwise ± 100 ppm ± 5 % of measured value (at 20 °C, 45 % RH, 1013 mbar, auto-calibration active)
Temperature dependence:	± 5 ppm per °C (at 20 °C)
Pressure dependence:	± 0.16 % per hPa based on standard pressure
Long-term stability:	< 1 % of final value per year
Gas exchange:	by diffusion
Warm-up time:	< 10 minutes
Response time:	< 5 minutes
Sensor protection:	Filter foil (sensor in pendulum)
Protective tube:	Ø 25.5 mm, L = 95 mm (see dimensional drawing)
Sensor cable:	PVC, H03VV-F, 4 x 0.14 mm², KL = 2 m
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination) colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	Cable gland made of plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Electrical connection:	0.14–1.5 mm², via screw terminals
Process connection:	via screws
Ambient temperature:	0...+50 °C (operation); –20...+50 °C (storage)
Permitted humidity:	10...95 % RH, non-condensing air
Response time:	< 5 min, running-in time < 20 min
Protection class:	III (as per EN 60 730)
Protection type:	IP 65 (as per EN 60 529) housing IP 30 (as per EN 60 529) pendulum
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
Optional:	**with display** in hinged cover housing BC" (90 x 80 x 47 mm), LCD display (128 x 64 pixels), display content can be rotated by 90° steps, backlight (on/off/auto), to display the actual CO2 content in ppm, set switching threshold, switching status and MIN/MAX of the selected interval (1 h / 6 h / 12 h / 24 h)

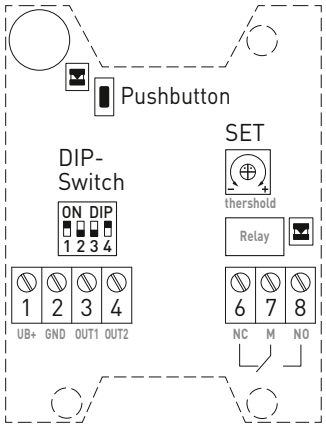
Schematic diagram **RPCO2**



Connection diagram **RPCO2**

1	+UB 24 V AC/DC
2	–UB GND
3	Output1 (CO2) 0-10V
4	Output2 (CO2) 4...20mA

Schematic diagram **RPCO2-W**



Connection diagram **RPCO2-W**

1	+UB 24 V AC/DC
2	–UB GND
3	Output1 (CO2) 0-10V
4	Output2 (CO2) 4...20mA
6	NC Normally Closed
7	M Common
8	NO Normally Open

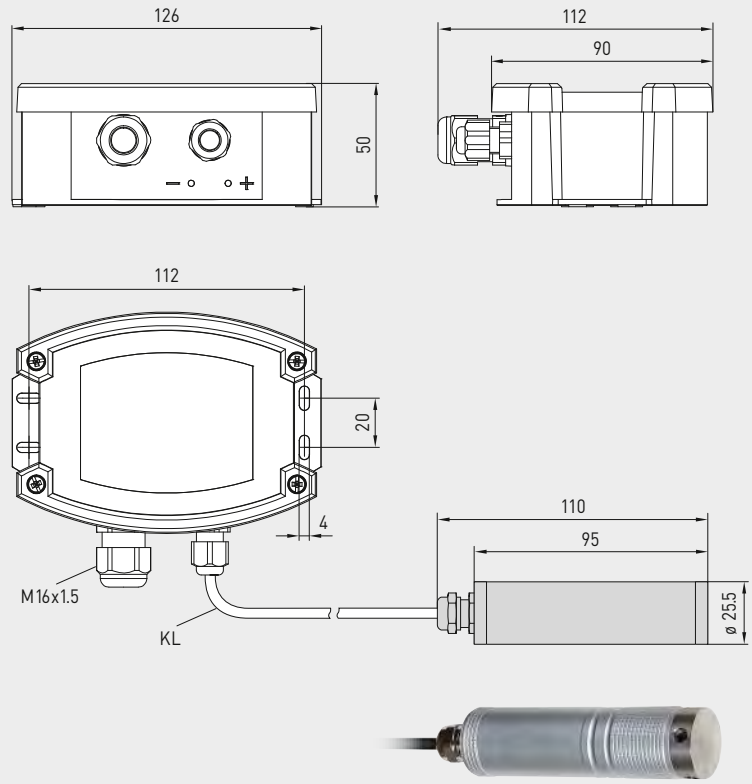
NEW

AERASGARD® RPCO2
AERASGARD® RPCO2 - W

Room pendulum CO2 sensor or measuring transducer, self-calibrating, with multi-range switching and active/switching output

Dimensional drawing
[mm]

RPCO2 - xx



RPCO2 - xx



Measuring range CO2 content	DIP 1	DIP 2	DIP 3
0...2000 ppm (default)	**ON**	OFF	OFF
0...5000 ppm	OFF	**ON**	OFF
0...10000 ppm	OFF	OFF	**ON**

Automatic CO2 calibration	DIP 4
activated (default)	**ON**
deactivated	OFF

AERASGARD® RPCO2 Room pendulum CO2 sensor or measuring transducer, *Premium*
AERASGARD® RPCO2 - W Room pendulum CO2 sensor or measuring transducer, *Premium*

Type / WG02	Measuring ranges CO2	Output 1 CO2	Output 2 CO2	Output switching	Display	Item no.	Price
RPCO2	(switchable)						
RPCO2	0...2000 ppm / 0...5000 ppm / 0...10000 ppm	0-10 V	4...20 mA	–		3CON-0203-0001-000	**376,44 €**
RPCO2 LCD	(3x as above)	0-10 V	4...20 mA	–	■	3CON-0206-0001-000	**427,85 €**
RPCO2 - W	(switchable)						
RPCO2-W	0...2000 ppm / 0...5000 ppm / 0...10000 ppm	0-10 V	4...20 mA	Changeover contact		3CON-0203-1001-000	**389,10 €**
RPCO2-W LCD	(3x as above)	0-10 V	4...20 mA	Changeover contact	■	3CON-0206-1001-000	**441,29 €**
Note:	This unit must **not** be used as a safety-relevant device!						

RHEASGARD® KHSSF xx
RHEASREG® KHSSWxx

Duct top-hat rail airflow sensor / airflow monitor, electronic, external flow probe incl. mounting flange, with active / switching output

NEW

S+S REGELTECHNIK

Electronic duct top-hat rail airflow sensor **RHE**ASGARD® **KHSSF** with active / switching output, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1…20 m/s). The measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0–10 V or 4…20 mA (**Automatic Output Switching**).

Electronic duct top-hat rail airflow monitor **RHE**ASREG® **KHSSW** with switching output, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1…20 m/s).

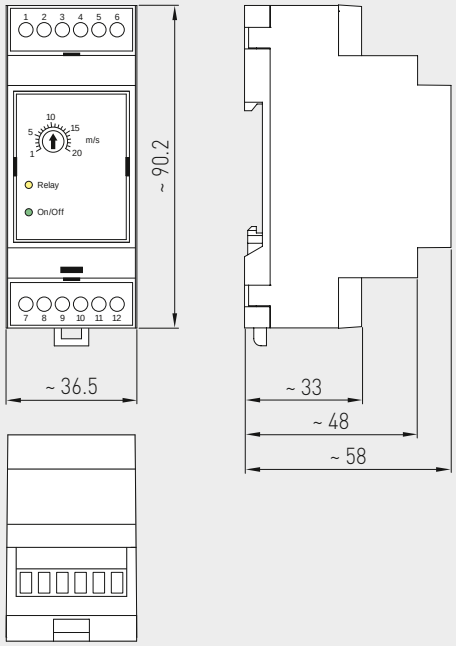
The flow sensors / flow monitors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) (**KHSSW-W24, KHSSF-W**) 230 V AC (± 10 %), 50 Hz (**KHSSW-W230**)		
Current consumption:	approx. 3 VA		
Outputs:	**KHSSF-W**	0–10 V / 4…20 mA (via **Automatic Output Switching** – the unit recognises the required output type and automatically switches to U or I output); 24 V changeover contact (max. 5 A, cos φ = 1), a switching hysteresis of 2 % final value, threshold can be adjusted via potentiometer	
	KHSSW-W24	24 V changeover contact (max. 5 A, cos φ = 1), a switching hysteresis of 2 % final value, threshold can be adjusted via potentiometer	
	KHSSW-W230	**230 V AC** changeover contact (max. 10 A, cos φ = 1), a switching hysteresis of 2 % final value, threshold can be adjusted via potentiometer	
Data point:	flow velocity (m/s)		
Sensor:	calorimetric, temperature compensated, sensor breakage protection		
Measuring range:	0.1…20 m/s		
Accuracy:	0.5 m/s + 3 % measured value		
Long-term stability:	± 0.5 % of final value per year		
Reproducibility:	± 1.0 % of final value		
Switching hysteresis:	2.0 % of final value		
Warm-up time:	< 2 min		
Response time:	< 5 s		
Start-up override:	60 s (changeover contact switched or 10 V / 20 mA at output, after applying the supply voltage)		
LED operating status indicator:	**Yellow LED**	off:	switching point not reached (contact 5-6 open)
		on:	switching point reached (contact 5-6 closed)
		flashing:	start-up override is active
	Green LED	on:	Unit is ready for operation
		flashing:	error in sensor or sensor line
Housing:	PC / ABS (UL94-V0) material, light grey colour, 36 mm (2TE) wide for 35 mm mounting rail, approx. 90 x 36 x 58 mm (H x W x D)		
Probe/sensor:	Polyamide (PA6) material, white colour (blue sensor holder), with torsion protection, Ø 12 mm, EL = approx. 20–155 mm, v_{max} = 30 m/s (air)		
Sensor cable:	PVC LiYY, 3-wire, KL = approx. 2.4 m		
Electrical connection:	0.14–2.5 mm², via screw terminal		
Process connection:	by means of mounting flange with seal (included in the scope of delivery)		
Ambient temperature:	storage –20…+50 °C; operation 0…+60 °C		
Medium temperature:	0…+70 °C		
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances		
Protection class:	II (according to EN 60 730) with UB = 230 V (**KHSSW-W230**) III (according to EN 60 730) with UB = 24 V (**KHSSW-W24, KHSSF-W**)		
Protection type:	**IP 30** (according to EN 60 529) housing **IP 20** (according to EN 60 529) sensor technology		
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, as per EN 61326-2-3		

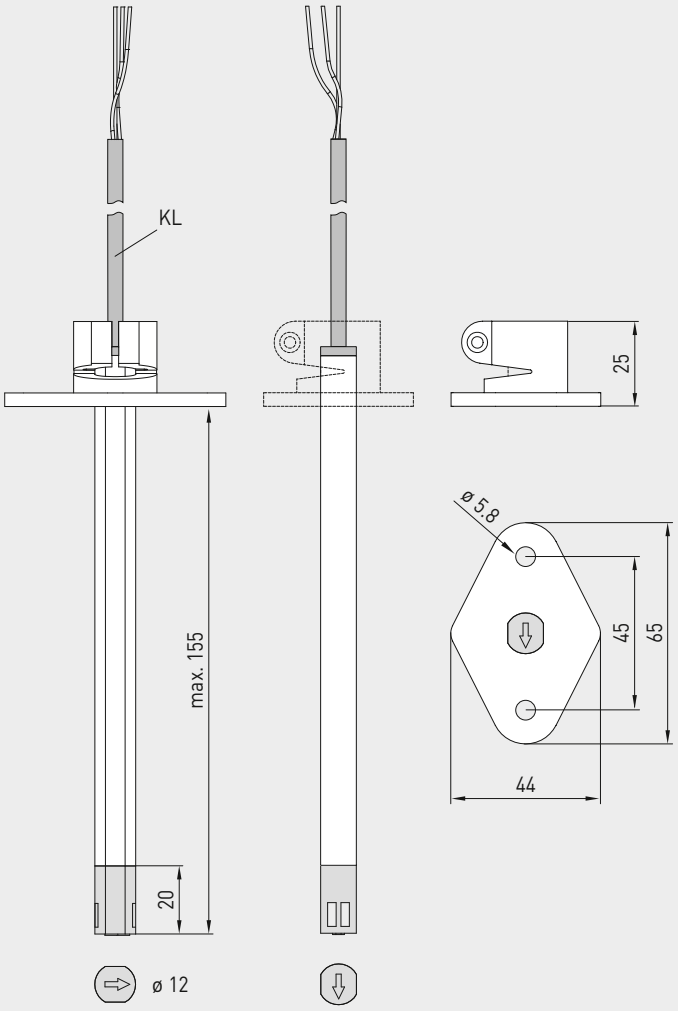
Dimensional drawing
[mm]

KHSSF xx
KHSSW xx



KHSSF xx
KHSSW xx
Housing





KHSSF xx
KHSSW xx
Probe



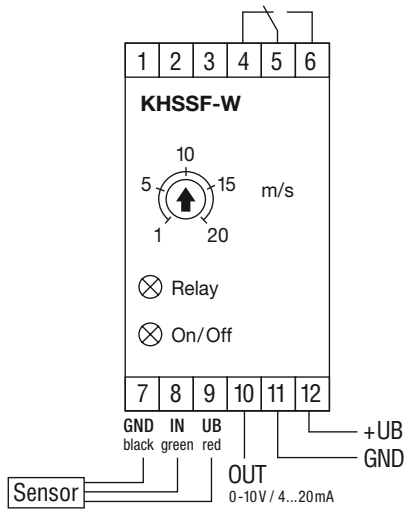
RHEASGARD® KHSSFxx
RHEASREG® KHSSWxx

Duct top-hat rail airflow sensor / airflow monitor, electronic, external flow probe incl. mounting flange, with active / switching output

NEW

S+S REGELTECHNIK

Schematic diagram **KHSSF-W**

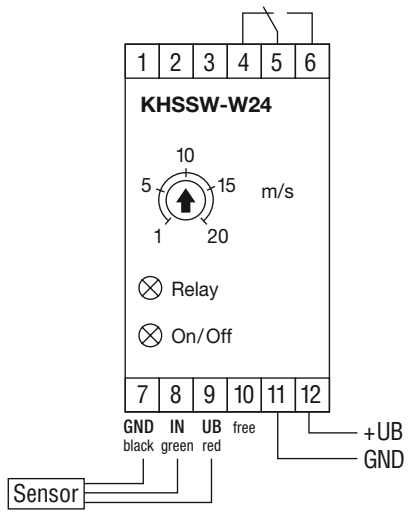




Automatic detection and switching to standard signal 0...10 V or 4...20 mA

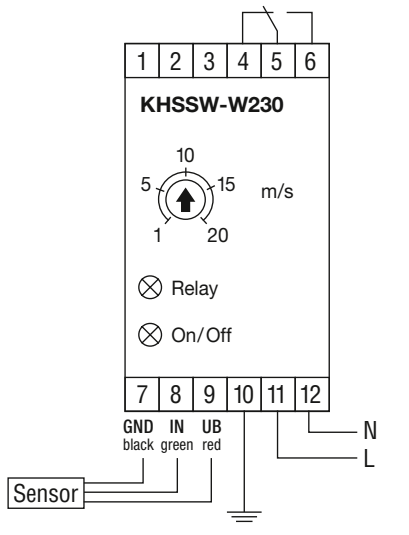
AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

Schematic diagram **KHSSW-W24**





Schematic diagram **KHSSW-W230**



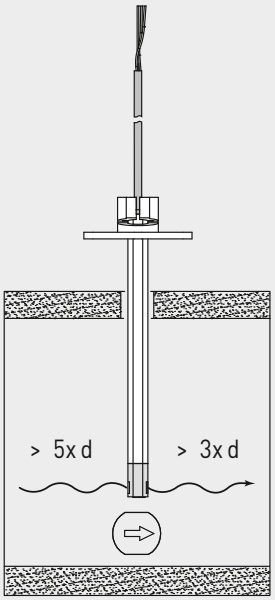


NEW

RHEASGARD® KHSSFxx
RHEASREG® KHSSWxx

Duct top-hat rail airflow sensor / airflow monitor, electronic, external flow probe incl. mounting flange, with active / switching output

Mounting diagram **KHSSF xx KHSSW xx**



Note for mounting:
Sensor works unidirectionally. Observe the markings for the direction of flow!



KHSSF xx KHSSW xx
Probe



RHEASGARD® **KHSSF** **RHE**ASREG® **KHSSW**	Duct top-hat rail airflow sensor, with active and switching output Duct top-hat rail airflow monitor, with switching output				
Type / WG01	**Power supply**	**Output active**	**Output switching**	**Item no.**	**Price**
KHSSF		**AOS**			
KHSSF-W	24 V AC / DC	0-10 V / 4...20 mA	1 changeover contact	1701-5118-0102-001	**338,87 €**
KHSSW					
KHSSW-W24	24 V AC / DC	–	1 changeover contact	1701-5113-0102-001	**226,60 €**
KHSSW-W230	**230 V** AC	–	1 changeover contact	1701-5133-0102-001	**226,60 €**
Note:	**Changeover contact** with automatic reset (relay opens automatically when value falls below the threshold again) **AOS** (**Automatic Output Switching**) = patented analogue interface (patent no. DE 10 2015 015 941 B4), the unit automatically detects the required output type 0–10 V or 4...20 mA				

RHEASGARD® KLGF xx
RHEASREG® KLSWxx

Duct air flow sensors / air flow monitors, incl. mounting flange, electronic, with active / switching output

NEW

S+S REGELTECHNIK

Electronic duct air flow sensor **RHE**ASGARD® **KLGF** with active output, housing made of impact-resistant plastic with quick-locking screws, with cable gland, with/without display, to determine the flow velocity (0.1...20 m/s). The measuring transducer converts the measurement signal into a standard signal of 0 - 10 V.

Electronic duct air flow sensor/monitor **RHE**ASGARD® **KLGFT** (without display) and **KLGFVT** (with display) with active and switching output, housing made of impact-resistant plastic with quick-locking screws, with cable gland, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C). For device type **KLGFVT** , the calculated volume flow parameter can be retrieved as an alternative to the flow (configurable on the display). The measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0 - 10 V or 4...20 mA (**Automatic Output Switching**).

Electronic duct airflow monitor **RHE**ASREG® **KLSW** with switching output, housing made of impact-resistant plastic with quick-locking screws, with cable gland, with/without display, to determine the flow velocity (0.1...20 m/s).

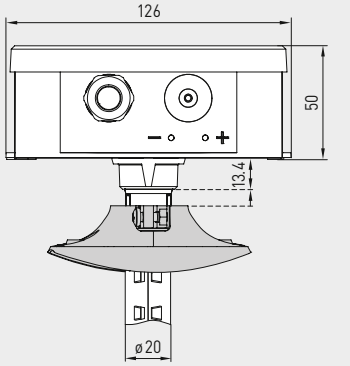
The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

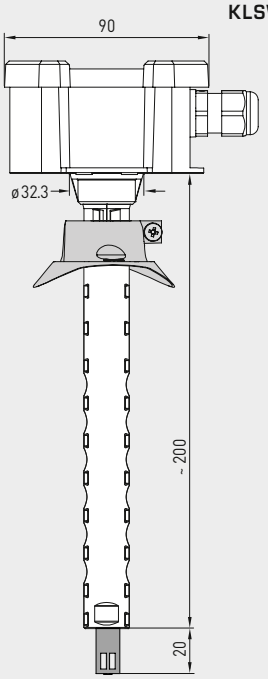
TECHNICAL DATA

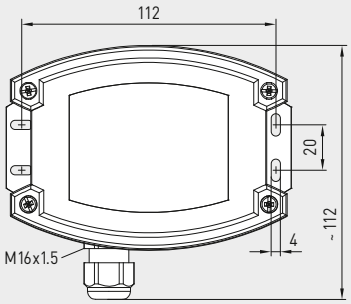
Power supply:	24 V AC / DC (± 10 %) (**KLSW-W24, KLGF xx**) 230 V AC, 50 Hz (**KLSW-W230**)	
Current consumption:	approx. 3 VA (**KLGF, KLSW-W24, KLSW-W230**) approx. 4 VA (**KLGFT, KLGFVT**)	
Data points:	flow velocity [m/s], volume flow [m³/h], temperature [°C]	
Outputs:	**KLGF**	**1x** 0 - 10 V (U variant)
	KLGF(V)T	**2x** 0 -10 V / 4...20 mA (via **Automatic Output Switching** – the unit recognises the required output type and automatically switches to U or I output); changeover contact 24 V (max. 5 A, cos φ = 1.0), switching hysteresis 2 % final value, threshold can be adjusted via potentiometer
	KLSW-W24	changeover contact 24 V (max. 5 A, cos φ = 1.0), switching hysteresis 2 % final value, threshold can be adjusted via potentiometer
	KLSW-W230	changeover contact **230 V AC** (max. 5 A, cos φ = 1.0), switching hysteresis 2 % final value, threshold can be adjusted via potentiometer
AIR FLOW		
Sensor:	calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)	
Measuring range:	0.1...20 m/s	
Accuracy:	0.5 m/s + 3 % measured value	
Long-term stability:	± 0.5 % final value per year	
Reproducibility:	± 1.0 % final value	
Warm-up time:	< 2 min	
Response time:	< 5 s	
Start-up override:	0 / 60 s (**KLGF/KLSW** without display), can be activated via DIP switch 0...120 s (**KLGF/KLSW** with display, **KLGFT/KLGFVT**), can be adjusted via potentiometer	
TEMPERATURE	**KLGF(V)T**	
Sensor:	NTC 10k	
Measuring range:	0...+50 °C	
Accuracy:	typical ± 0.5 K at +25 °C	
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20mm, NL = 220 mm, v_{max} = 30 m/s (air), optional on request made of **stainless steel V2A** (1.4301), Ø 16 mm	
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!	
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)	
Cable connection:	**cable gland** , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)	
Electrical connection:	0.2 - 1.5 mm², via push-in terminal	
Process connection:	by means of plastic mounting flange (included in the scope of delivery)	
Ambient temperature:	storage –20...+50 °C; operation 0...+50 °C	
Medium temperature:	0...+70 °C	
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances	
Protection class:	II (according to EN 60 730) with UB = 230 V (**KLSW-W230**) III (according to EN 60 730) with UB = 24 V (**KLSW-W24, KLGF xx**)	
Protection type:	**IP 65** (according to EN 60 529) housing; IP 20 sensor technology	
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3	
Optional:	**display with illumination,** three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature	

Dimensional drawing
[mm]

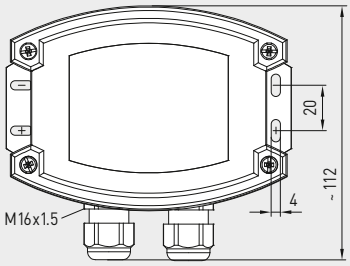
KLGF xx
KLSW xx







KLSW-W230





KLGF xx
KLSW xx
without display



KLSW-W230
without display



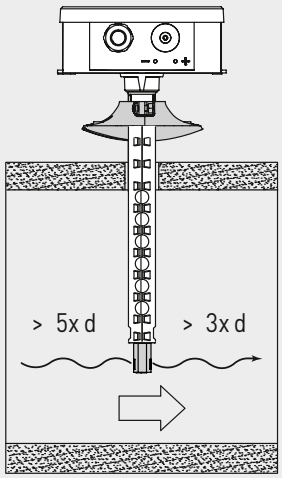
KLSW / KLGF
with display



KLGFVT
with display

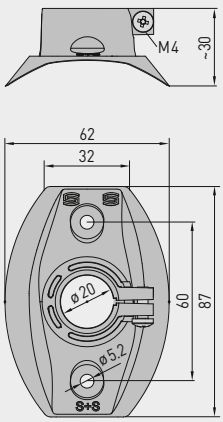
Installation diagram

KLGF xx
KLSW xx



Dimensional drawing
[mm]

MFT-20-K





MFT-20-K
Mounting flange
made of plastic

Automatic detection and switching
to standard signal 0...10 V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

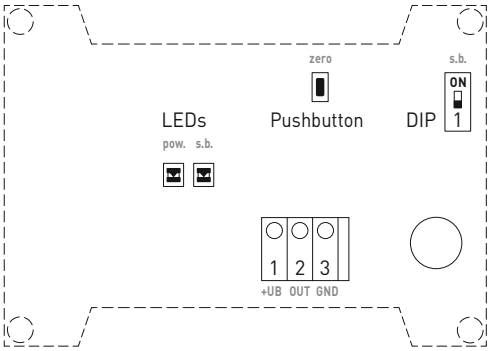
RHEASGARD® KLGF xx
RHEASREG® KLSWxx

Duct air flow sensors / air flow monitors, incl. mounting flange, electronic, with active / switching output

NEW

S+S REGELTECHNIK

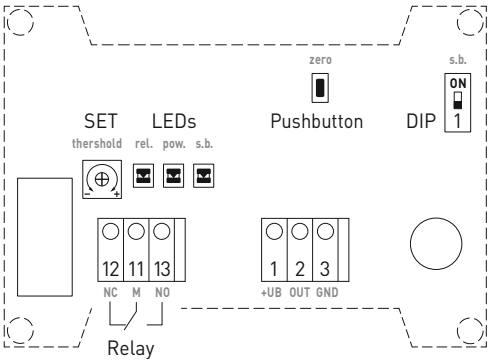
Schematic diagram **KLGF-U**



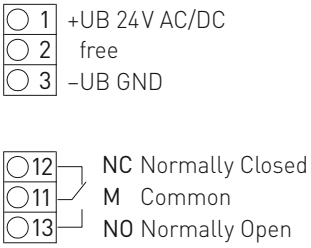
Connecting diagram **KLGF-U** without display



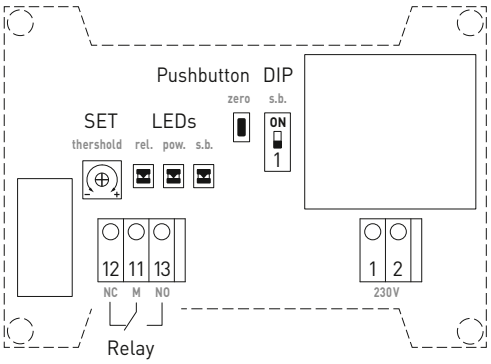
Schematic diagram **KLSW-W24**



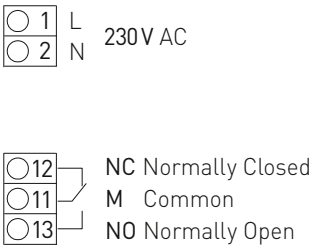
Connecting diagram **KLSW-W24** without display



Schematic diagram **KLSW-W230**



Connecting diagram **KLSW-W230** without display



KLSW-W230
with changeover contact,
UB = 230 V



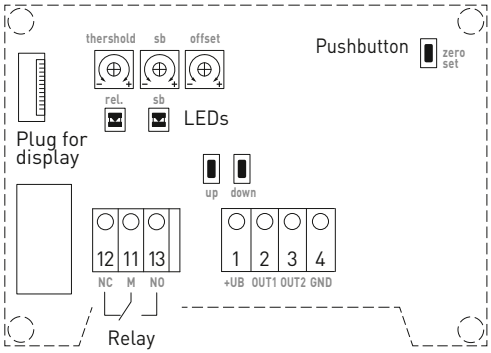
KLSW-W24
with changeover contact,
UB = 24 V



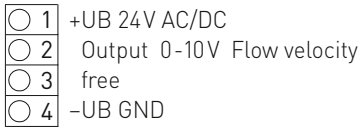
KLGF-U
with output 0 - 10 V,
UB = 24 V



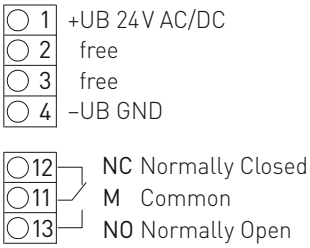
Schematic diagram — **KLGF/KLSW-xx LCD**
KLGFT-W



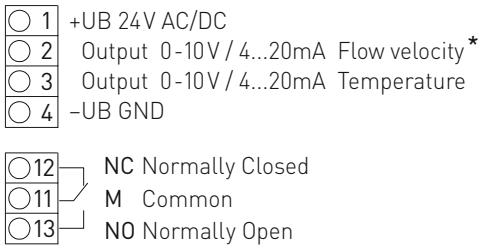
Connecting diagram — **KLGF-U LCD**



Connecting diagram — **KLSW-W24 LCD**



Connecting diagram — **KLGFVT-W LCD**
KLGFT-W



* **KLGFVT-W LCD:**
Switching from flow measurand
to the alternative **volume flow** parameter
is menu-controlled on the display.

RHEASGARD® **KLGF**	Duct air flow sensor, electronic, with active output
RHEASGARD® **KLGF(V)T**	Duct air flow sensor, electronic, with active and switching output
RHEASREG® **KLSW**	Duct air flow monitor, electronic, with switching output

Type / WG01	Power supply	Output active	Output switching	other Parameters	Display	Item no.	Price
KLGF		**U-Variante**					
KLGF-U	24 V AC / DC	**1x** 0-10 V	–	–		1701-4111-0101-000	**243,34 €**
KLGF-U **LCD**	24 V AC / DC	**1x** 0-10 V	–	–	■	1701-4111-1101-000	**306,06 €**
Optional:	Cable connection with **M12 connector** as per DIN EN 61076-2-101					on request	
KLGF(V)T		**AOS**					
KLGFT-W	24 V AC / DC	**2x** 0-10 V / 4...20 mA	1 changeover contact	**T**		1701-4118-0201-001	**308,23 €**
KLGFVT-W LCD	24 V AC / DC	**2x** 0-10 V / 4...20 mA	1 changeover contact	**T | V**	■	1701-4118-1401-001	**379,61 €**
KLSW-W24							
KLSW-W24	24 V AC / DC	–	1 changeover contact	–		1701-4113-0101-001	**213,06 €**
KLSW-W24 **LCD**	24 V AC / DC	–	1 changeover contact	–	■	1701-4113-1101-001	**264,97 €**
KLSW-W230							
KLSW-W**230**	**230 V** AC	–	1 changeover contact	–		1701-4133-0101-001	**214,68 €**

Note:

Changeover contact with automatic reset
(relay opens automatically when value falls below the threshold again)

AOS (**Automatic Output Switching**) = patented analogue interface (patent no. DE 10 2015 015 941 B4),
the unit automatically detects the required output type 0 - 10 V or 4...20 mA

T = **temperature** (0...+50 °C) – additional measurand
V = **volume flow** (0...200,000 m³/h) – alternative parameter, can be configured via display!

Vane switch, mechanical, with paddle, with switching output

S+S REGELTECHNIK

Mechanical wind vane switch **RHE**ASREG® **WFS** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of gaseous, non-aggressive media.

The flow sensor is used as a flow controller or air flow monitor in air conditioning ducts, in air intake or exhaust devices of ventilators or electric heating registers (also for contaminated, oily air).

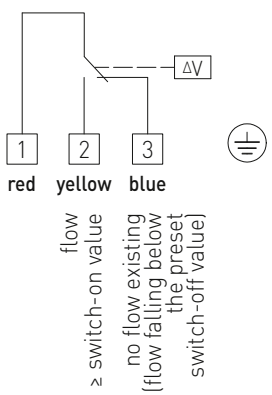
WFS



TECHNICAL DATA

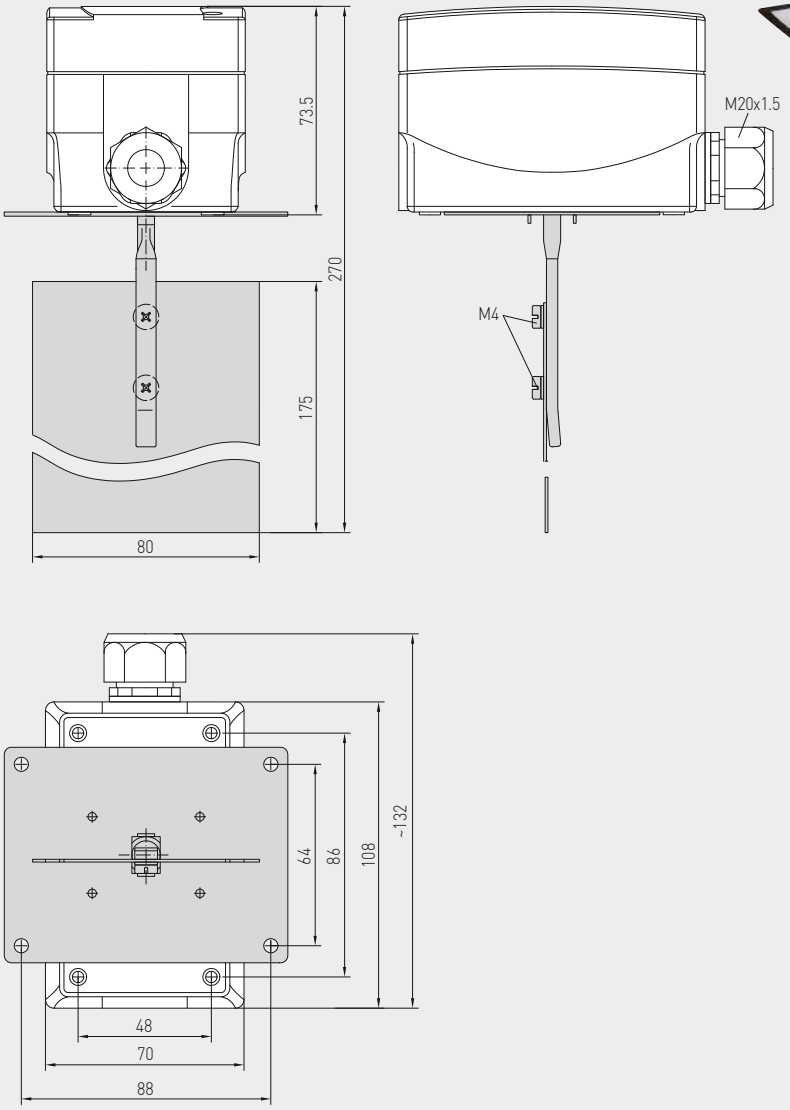
Switching capacity: (Contact load)	15 (8) A; 24…250 V AC at 24 V AC min. 150 mA
Contact:	dustproof microswitch as single-pole, potential-free changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Base body:	galvanised steel
Moving arm:	brass
Vane:	stainless steel **V2A** (1.4301)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	–40…+85 °C
Operating difference:	≥ 1,5 m / s
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	
Monitor:	Contact 1 - 3 breaks when flow rate drops to the preset value. Simultaneously, contact 1 - 2 closes and can be used as signal contact.
Assembly note:	the installation is only possible in **horizontal** air ducts. Make sure that there is a **damping section** (≥ 5 times the pipe diameter) before and after the installation location. For **wind speeds > 5 m/s**, cut the vane/paddle at the marked spots. This will result in an increase of the default values (see table).

Connecting diagram **WFS**



Dimensional drawing

WFS



WFS



RHEASREG® WFS	Vane switch, mechanical, with paddle						
Type / WG01	Switch-on value [m/s] min.		max.	Switch-off value [m/s] min.		max.	Item No.	Price
WFS								
WFS-1E	**2,5**	(4,0)	9,2	**1,0**	(2,5)	8,0	1702-3020-0000-000	**93,04 €**
Note:	Minimum values in brackets apply to wind speeds > 5 m/s							
Spare part								
PWFS-08	Spare paddle for WFS (Stainless steel vane)						7700-0010-2000-000	**19,17 €**

Flow monitors, mechanical, with paddle, with switching output

S+S REGELTECHNIK

Mechanical paddle flow monitor **RHE**ASREG® **SW** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of liquid and gaseous, non-aggressive media in pipes, hydraulic systems of ¾'' through ½'' to 8'' diameter.

The flow sensor is used as a flow controller or low water alarm, e. g. for pumps in oil and cooling circuits, cooling systems, evaporators, compressors and heat exchangers, with brass or stainless-steel bodies.

SW





SW-3E
SW-4E

Incl. attached Tee Fitting according to DIN 2950

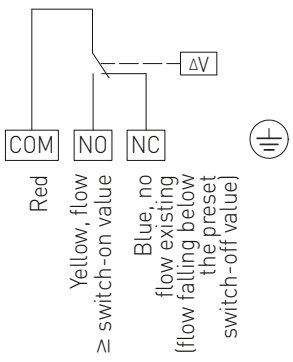
TECHNICAL DATA

Switching capacity:	15 (8) A; 24…250 V AC, at 24 V AC min. 150 mA
Contact:	dustproof microswitch as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Base body:	galvanised steel
Screwed socket:	brass or stainless steel (see table)
Paddle:	stainless steel **V4A** (1.4401)
Cable connection:	**cable gland**, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	–40…+85 °C
Max. temperature of medium:	+120 °C
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	
Monitor:	Contact COM – NO (red – yellow) breaks when flow rate drops to the preset value. Simultaneously, contact COM – NC (red - blue) closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal pipes, tee R x'' according to DIN 2950, min. smoothing distance = 5 x pipe diameter upstream and downstream of paddle

Table of switching values

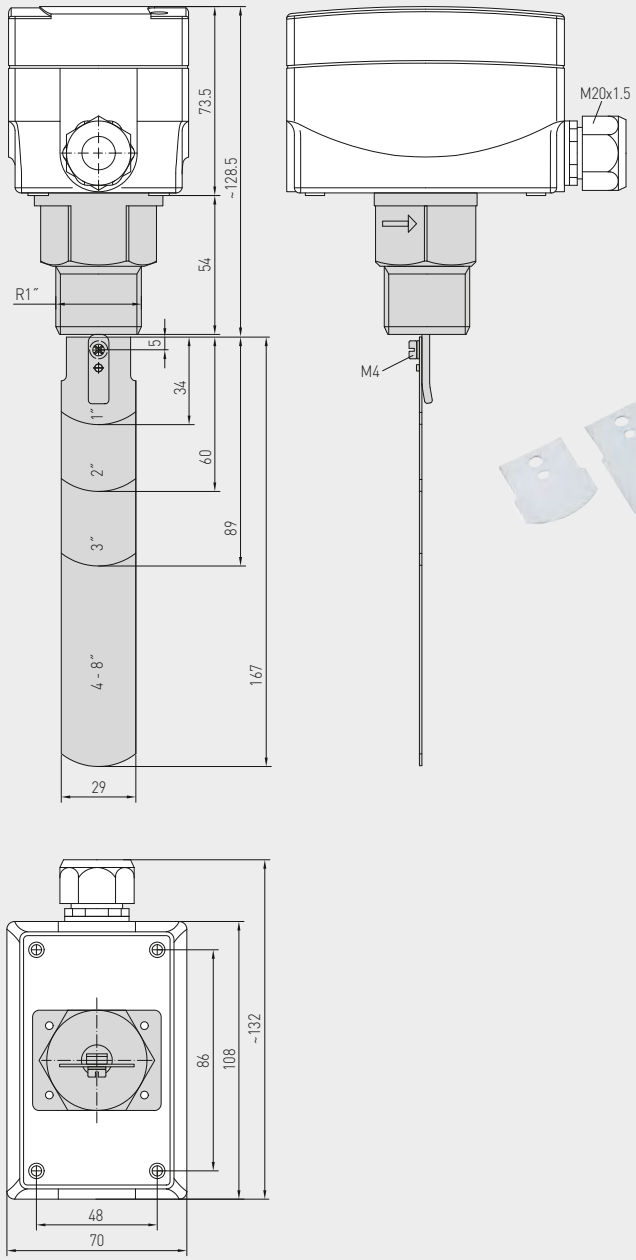
Pipe Ø DN (inches)	Paddle combination PSW-09	Factory Setting OFF / ON (m³/h)	Max. Setting OFF / ON (m³/h)
SW-1 / SW-2			
1"	1	0.6 / 1.0	2.0 / 2.1
1 ¼"	1	0.8 / 1.3	2.8 / 3.0
1 ½"	1	1.1 / 1.7	3.7 / 4.0
2"	1, 2	2.2 / 3.1	5.7 / 6.1
2 ½"	1, 2	2.7 / 4.0	6.5 / 7.0
3"	1, 2, 3	4.3 / 6.2	10.7 / 11.4
4"	1, 2, 3	11.4 / 14.7	27.7 / 29.0
	1, 2, 3, 4	6.1 / 8.0	17.3 / 18.4
5"	1, 2, 3	22.9 / 28.4	53.3 / 55.6
	1, 2, 3, 4	9.3 / 12.9	25.2 / 26.8
6"	1, 2, 3	35.9 / 43.1	81.7 / 85.1
	1, 2, 3, 4	12.3 / 16.8	30.6 / 32.7
8"	1, 2, 3	72.6 / 85.1	165.7 / 172.5
	1, 2, 3, 4	38.6 / 46.5	90.8 / 94.2
SW-3 / SW-4			
½"	–	0.174 / 0.48	0.846 / 0.948
¾"	–	0.138 / 0.408	0.768 / 0.858

Connecting diagram **SW**



Dimensional drawing

SW
PSW-09



SW





PSW-09
Set of stainless steel paddles (Spare part)

Pipe diameters with paddle combinations

Pipe Ø DN (inches)	(mm)	Paddle combination PSW-09	
½"	15 mm	–	(SW-3E incl. Tee Fitting)
¾"	20 mm	–	(SW-4E incl. Tee Fitting)
1"	25 mm	1	
1 ¼"	32 mm	1	
1 ½"	40 mm	1	
2"	50 mm	1, 2	
2 ½"	65 mm	1, 2	
3"	80 mm	1, 2, 3	
4"	100 mm	1, 2, 3 plus 4	(shorten to 92 mm)
5"	125 mm	1, 2, 3 plus 4	(shorten to 117 mm)
6"	150 mm	1, 2, 3 plus 4	(shorten to 143 mm)
8"	200 mm	1, 2, 3 plus 4	(unshortened)

RHEASREG® SW Flow monitors, mechanical, with paddle

Type / WG01	Pipe Ø DN	Max. Operating Pressure PN max	Medium	(Contacting Parts Made of)	Incl. attached Tee Fitting according to DIN 2950	Item No.	Price
SW							
SW-1E	1" - 8"	**11 bar**	**normal**	(brass)	–	1702-3011-0000-000	**119,68 €**
SW-2E	1" - 8"	**30 bar**	**aggressive**	(stainless steel **V4A**)	–	1702-3012-0101-000	**378,57 €**
SW-3E	½"	**11 bar**	**normal**	(brass)	⊥⊥	1702-3013-0031-000	**220,46 €**
SW-4E	¾"	**11 bar**	**normal**	(brass)	⊥⊥	1702-3014-0041-000	**220,46 €**
Spare part							
PSW-09	**Set of stainless steel paddles**, 4 pieces, pipe Ø 1" - 8", for SW-1E and SW-2E (included in the scope of delivery)					7700-0010-1000-000	**19,80 €**

Accessories

S+S added value –
smart supplements, always ahead

Take advantage of our comprehensive range of accessories, which can be used together with our entire product portfolio. This keeps you always a step ahead, and best of all: If you buy and stock up, you will also save on the price.

Our standard devices normally differ in type of design and sensors. Depending on the application, you can install S+S accessories directly on site.



S+S REGELTECHNIK



IMMERSION SLEEVES & ACCESSORIES

Immersion sleeves

TH 08	Immersion sleeves for temperature sensors	**638**
TH	Immersion sleeves for temperature sensors	**640**
THR	Immersion sleeves for temperature controllers	**642**
THE	Immersion sleeves for sleeve sensors	**644**

Mounting accessories

MFT-20-K	Mounting flange, plastic	**646**
MF-xx-K	Mounting flange, plastic	**646**
MF-xx-M	Mounting flange, metal	**647**
KRD-04	Capillary tube gland bracket, plastic	**646**
MK-xx	Mounting brackets	**647**
ESSH	Welding protection sleeve	**648**
KVSS / KVST	Clamp connections	**648**
TH-Adapter-HW	Immersion sleeve adapter (Honeywell / CentraLine)	**648**

Accessories for differential pressure switches

ASD-06	Connection set	**649**
ASD-07	Connection nipple (90°)	**649**
ASS-UV	Connection hose, UV-resistant	**649**
DAL	Pressure outlet	**649**
DS-MW	Mounting bracket, sheet steel	**649**

Protection hoods

WS-01	Sun and ball-impact protection hood	**650**
WS-03	Weather and sun protection hood (Tyr 2)	**650**
WS-04	Weather and sun protection hood (Tyr 1)	**650**

Spare parts, small parts

SF-xx	Sinter filters, replaceable	**651**
PSW-09	Stainless steel paddle (SW)	**651**
PWFS-08	Stainless steel vane (WFS)	**651**
WH-20	Wall holder (KH)	**651**
HS-Adapter	Universal holder for small housing (top hat rails)	**651**
Modbus-Y	Y-adapter for cable gland	**651**
SPB-1	Strap for surface-contact sensor	**651**
WLP-1	Heat-conductive paste, silicone-free	**651**

Special accessories for plug-in connectors

Connection accessories, A-coded, 5-pin or 12-pin	**652**
Connection accessories, EtherCATP-coded, 4-pin	**653**

Miscellaneous

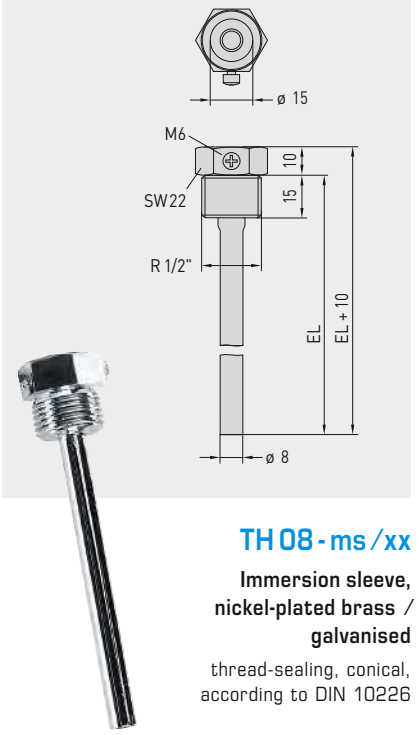
Optional services, single services	**654**
Custom-made products	**655**

THERMASGARD® TH 08

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, for temperature sensors and measuring transducers
TF 43, TM 43, TF 65, TM 65, TM 65-Modbus (Tyr 1))

S+S REGELTECHNIK

Dimensional drawing **TH 08-ms/xx**

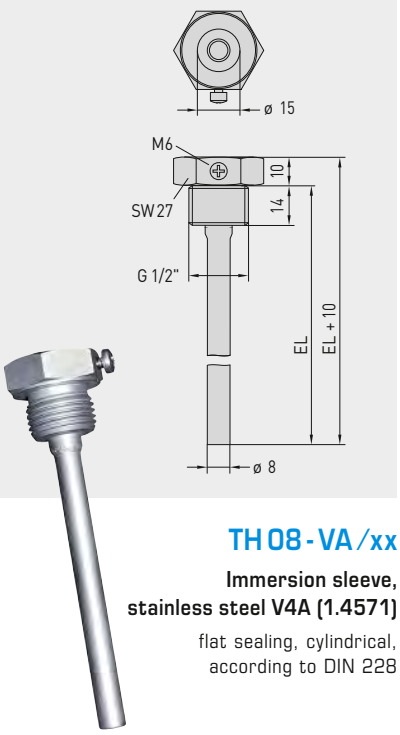


TH 08-ms/xx

Immersion sleeve, nickel-plated brass / galvanised

thread-sealing, conical, according to DIN 10226

Dimensional drawing **TH 08-VA/xx**

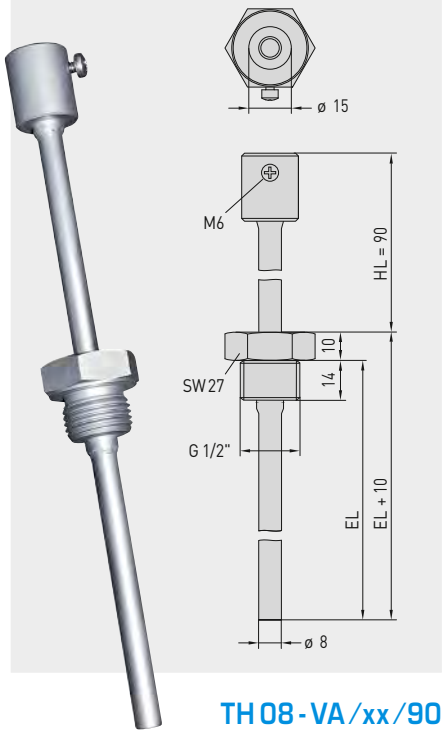


TH 08-VA/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

Dimensional drawing **TH 08-VA/xx/90**



TH 08-VA/xx/90

Immersion sleeve, stainless steel V4A (1.4571) with neck tube

flat sealing, cylindrical, according to DIN 228

THERMASGARD® TH 08 Immersion sleeve Ø 8 mm

Type / WG01	p_{max} (static)	T_{max}	Inserted length (EL)	Item No.	Price
TH 08-ms/xx	**Brass nickel-plated / galvanised**			**Ø 8** x 0.75 mm	
TH08-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-132	**12,90 €**
TH08-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-132	**13,50 €**
TH08-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-132	**14,60 €**
TH08-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-132	**15,62 €**
TH08-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-132	**18,09 €**
TH08-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-132	**18,90 €**
TH08-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-132	**19,40 €**
TH08-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-132	**19,90 €**
TH 08-VA/xx	**Stainless steel V4A** (1.4571)			**Ø 8** x 0.75 mm	
TH08-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-132	**22,24 €**
TH08-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-132	**24,50 €**
TH08-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-132	**26,50 €**
TH08-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-132	**27,80 €**
TH08-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-132	**34,60 €**
TH08-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-132	**36,20 €**
TH08-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-132	**36,90 €**
TH08-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-132	**37,90 €**
TH 08-VA/xx/90	**Stainless steel V4A** (1.4571), with neck tube (90mm)			**Ø 8** x 0.75 mm	
TH08-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-0012-132	**29,91 €**
TH08-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-0022-132	**31,26 €**
TH08-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-0032-132	**32,80 €**
TH08-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-0042-132	**34,19 €**
TH08-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-0052-132	**35,83 €**
TH08-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-0062-132	**38,84 €**
Note:	Inner diameter of socket 15.0 mm				

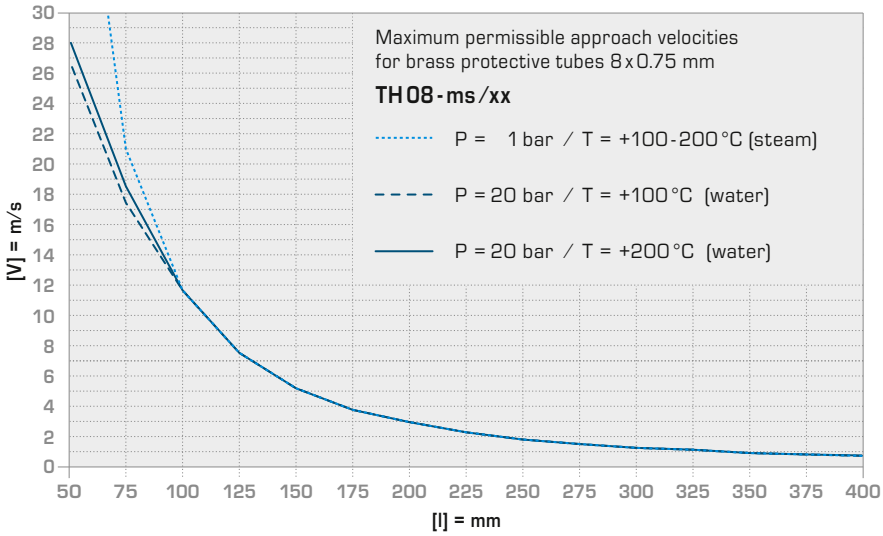
INSTRUCTIONS FOR PLANNING AND INSTALLATION

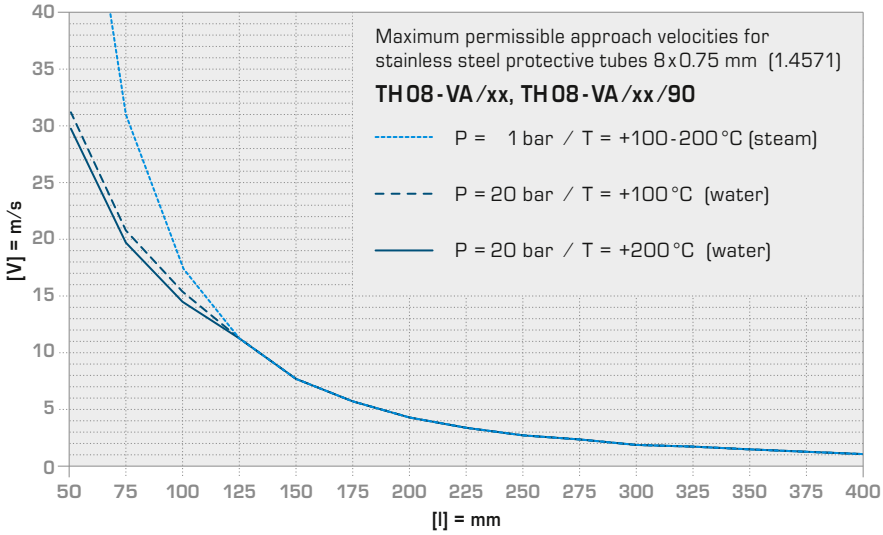
The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **TH08-VA**) as well as for brass protective tubes (see graph **TH08-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

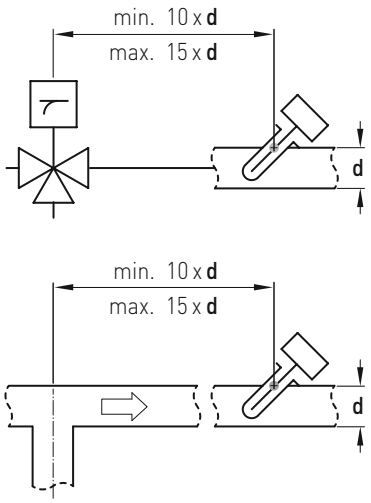




MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

Mixing section **TH08**



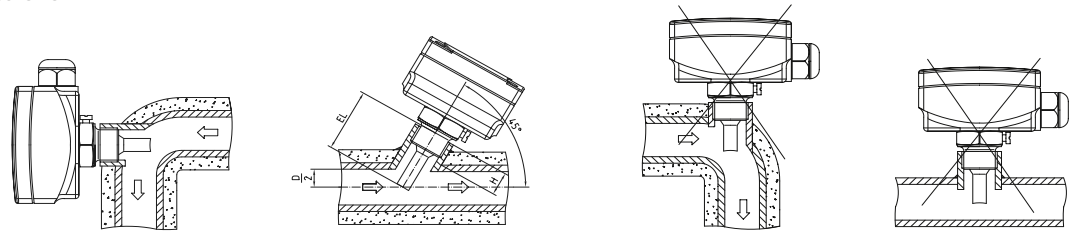
When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

Installation scheme **TH08**

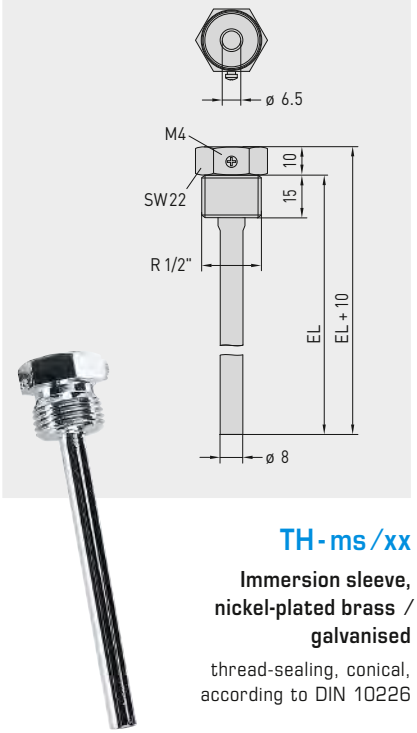


THERMASGARD® TH

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, for temperature sensors and measuring transducers TF 54 / TM 54 (form B)

S+S REGELTECHNIK

Dimensional drawing **TH-ms/xx**

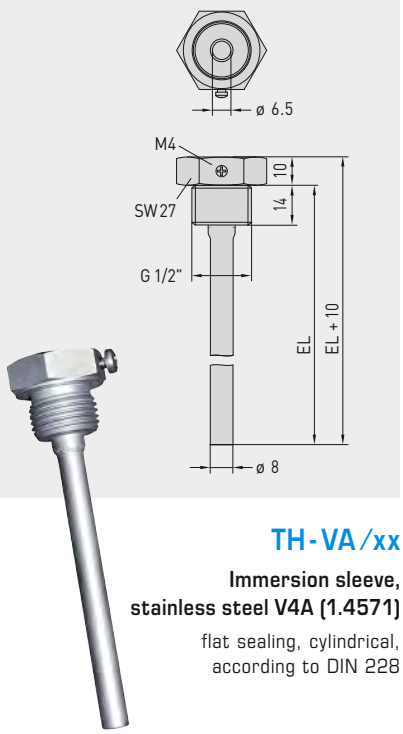


TH-ms/xx

Immersion sleeve, nickel-plated brass / galvanised

thread-sealing, conical, according to DIN 10226

Dimensional drawing **TH-VA/xx**

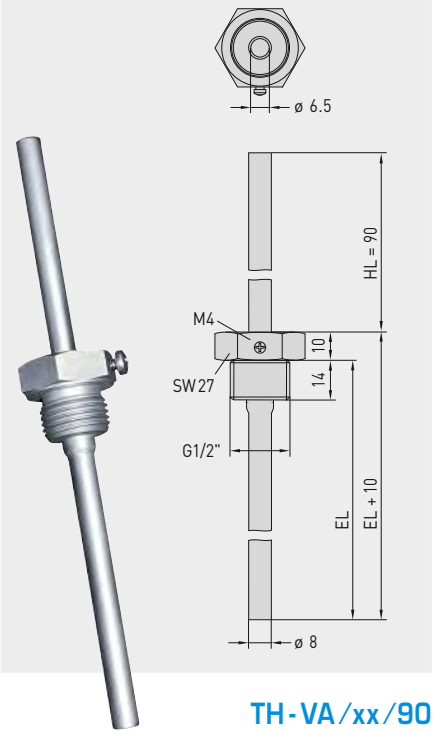


TH-VA/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

Dimensional drawing **TH-VA/xx/90**



TH-VA/xx/90

Immersion sleeve, stainless steel V4A (1.4571) with neck tube

flat sealing, cylindrical, according to DIN 228

THERMASGARD® TH Immersion sleeve Ø 8 mm

Type / WG01	p_{max} (static)	T_{max}	Inserted length (EL)	Item No.	Price
TH-ms/xx	**Brass nickel-plated / galvanised**			**Ø 8** x 0.75 mm	
TH-MS 50MM	10 bar	+150 °C	**50 mm**	7100-0011-0010-001	**9,59 €**
TH-MS 100MM	10 bar	+150 °C	**100 mm**	7100-0011-0020-001	**10,93 €**
TH-MS 150MM	10 bar	+150 °C	**150 mm**	7100-0011-0030-001	**11,54 €**
TH-MS 200MM	10 bar	+150 °C	**200 mm**	7100-0011-0040-001	**11,91 €**
TH-MS 250MM	10 bar	+150 °C	**250 mm**	7100-0011-0050-001	**13,79 €**
TH-MS 300MM	10 bar	+150 °C	**300 mm**	7100-0011-0060-001	**14,17 €**
TH-MS 350MM	10 bar	+150 °C	**350 mm**	7100-0011-0070-001	**14,29 €**
TH-MS 400MM	10 bar	+150 °C	**400 mm**	7100-0011-0080-001	**14,42 €**
TH-VA/xx	**Stainless steel V4A** (1.4571)			**Ø 8** x 0.75 mm	
TH-VA 50MM	40 bar	+600 °C	**50 mm**	7100-0012-0010-001	**20,89 €**
TH-VA 100MM	40 bar	+600 °C	**100 mm**	7100-0012-0020-001	**23,08 €**
TH-VA 150MM	40 bar	+600 °C	**150 mm**	7100-0012-0030-001	**24,80 €**
TH-VA 200MM	40 bar	+600 °C	**200 mm**	7100-0012-0040-001	**26,14 €**
TH-VA 250MM	40 bar	+600 °C	**250 mm**	7100-0012-0050-001	**32,50 €**
TH-VA 300MM	40 bar	+600 °C	**300 mm**	7100-0012-0060-001	**33,96 €**
TH-VA 350MM	40 bar	+600 °C	**350 mm**	7100-0012-0070-001	**34,19 €**
TH-VA 400MM	40 bar	+600 °C	**400 mm**	7100-0012-0080-001	**34,79 €**
TH-VA/xx/90	**Stainless steel V4A** (1.4571), with neck tube (90mm)			**Ø 8** x 0.75 mm	
TH-VA 50/90MM	40 bar	+600 °C	**50 mm**	7100-0012-2010-001	**29,91 €**
TH-VA 100/90MM	40 bar	+600 °C	**100 mm**	7100-0012-2020-001	**31,26 €**
TH-VA 150/90MM	40 bar	+600 °C	**150 mm**	7100-0012-2030-001	**32,80 €**
TH-VA 200/90MM	40 bar	+600 °C	**200 mm**	7100-0012-2040-001	**34,19 €**
TH-VA 250/90MM	40 bar	+600 °C	**250 mm**	7100-0012-2050-001	**35,83 €**
TH-VA 300/90MM	40 bar	+600 °C	**300 mm**	7100-0012-2060-001	**38,84 €**
Note:	Inner diameter of socket 6.5 mm				

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, for temperature sensors and measuring transducers TF 54 / TM 54 (form B)

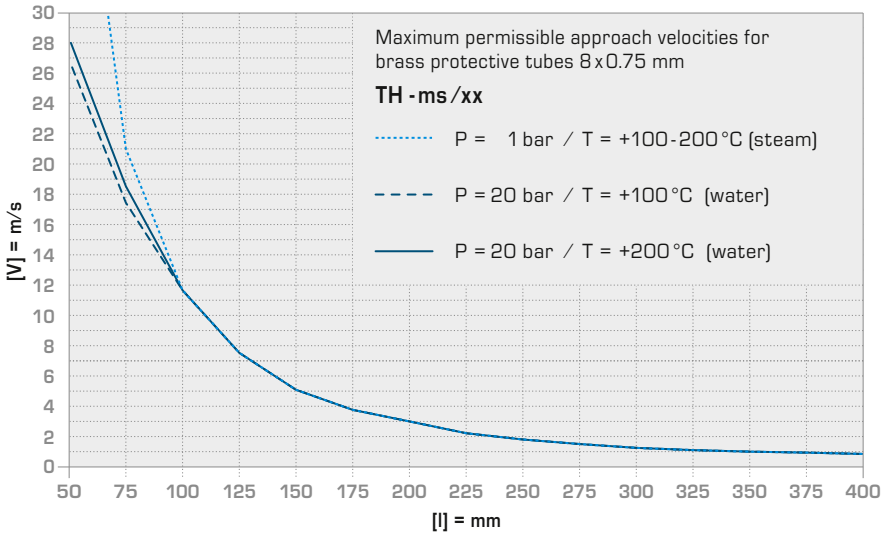
INSTRUCTIONS FOR PLANNING AND INSTALLATION

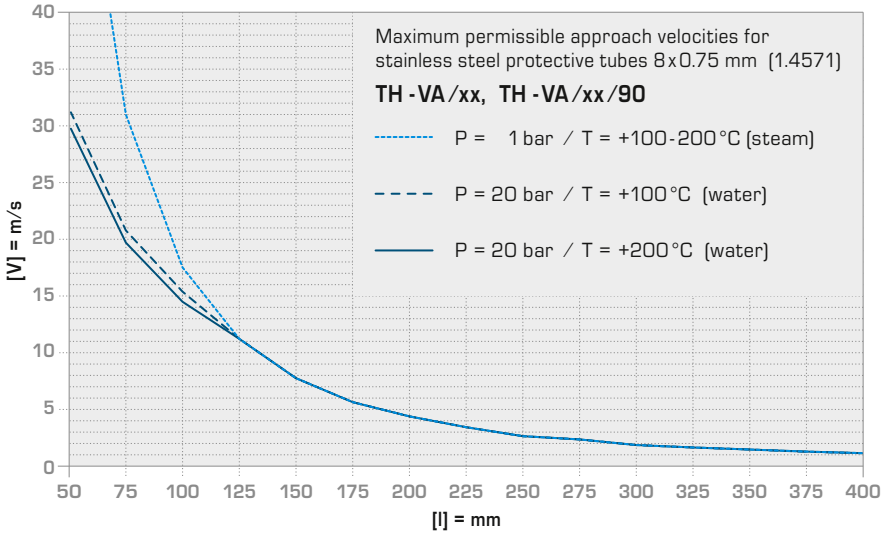
The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **TH-VA**) as well as for brass protective tubes (see graph **TH-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

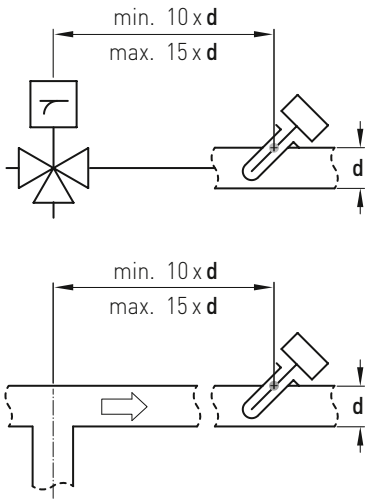




MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

Mixing section **TH**



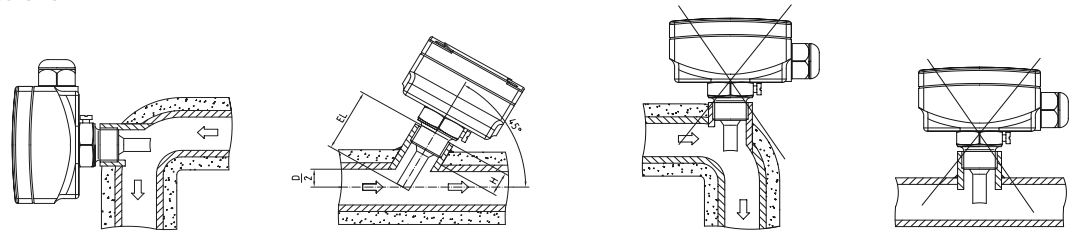
When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

Installation scheme **TH**

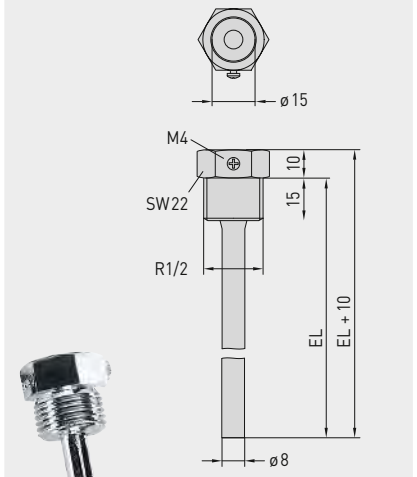


THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, for temperature controllers ETR (Thor 2)

S+S REGELTECHNIK

Dimensional drawing **THR-ms-08/xx**



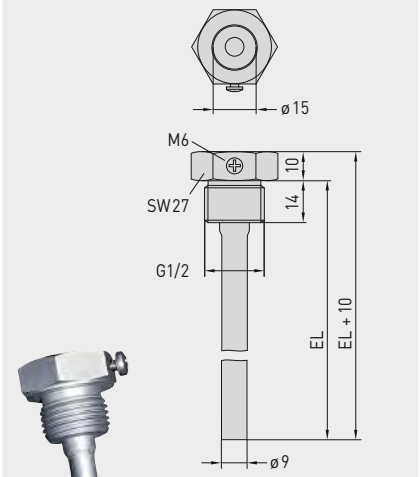


THR-ms-08/xx

Immersion sleeve, nickel-plated brass / galvanised

thread-sealing, conical, according to DIN 10226

Dimensional drawing **THR-VA-09/xx**



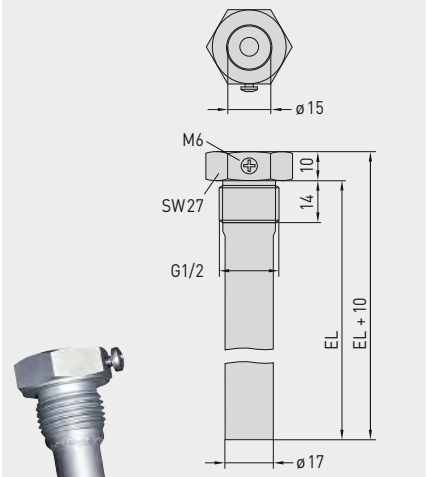


THR-VA-09/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

Dimensional drawing **THR-VA-17/xx**





THR-VA-17/xx

Immersion sleeve, stainless steel V4A (1.4571)

flat sealing, cylindrical, according to DIN 228

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In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm for **THERMASREG® ETR** (Thor 2)

Type / WG01	p_{max} (static)	T_{max}	Time Constant for Medium: Air	Water	Oil	Inserted Length (EL)	Item No. Ø	Price
THR-ms-08/xx	**Brass nickel-plated / galvanised**						**Ø 8** x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	**100 mm**	7100-0011-3022-000	**15,88 €**
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	**150 mm**	7100-0011-3404-000	**16,02 €**
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	**200 mm**	7100-0011-3403-000	**19,02 €**
THR-VA-09/xx	**Stainless steel V4A** (1.4571)						**Ø 9** x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	**100 mm**	7100-0012-3022-000	**40,91 €**
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	**150 mm**	7100-0012-3032-000	**42,22 €**
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	**200 mm**	7100-0012-3042-000	**45,24 €**
THR-VA-17/xx	**Stainless steel V4A** (1.4571)						**Ø 17** x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	**150 mm**	7100-0012-3033-000	**42,22 €**
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	**200 mm**	7100-0012-3404-000	**45,24 €**
Ordering example:	THR-ms-08/**100** (Brass immersion sleeve, Ø = 8 mm, **EL = 100** mm) THR-VA-09/**150** (Stainless steel immersion sleeve, Ø = 9 mm, **EL = 150** mm) THR-VA-17/**200** (Stainless steel immersion sleeve, Ø = 17 mm, **EL = 200** mm)							
Note:	inner diameter of socket 15.0 mm							

THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, for temperature controllers ETR (Thor 2)

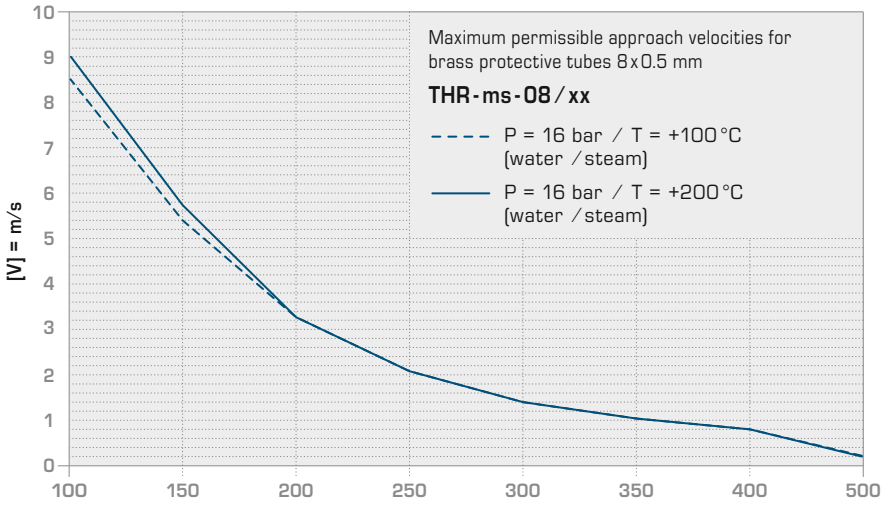
INSTRUCTIONS FOR PLANNING AND INSTALLATION

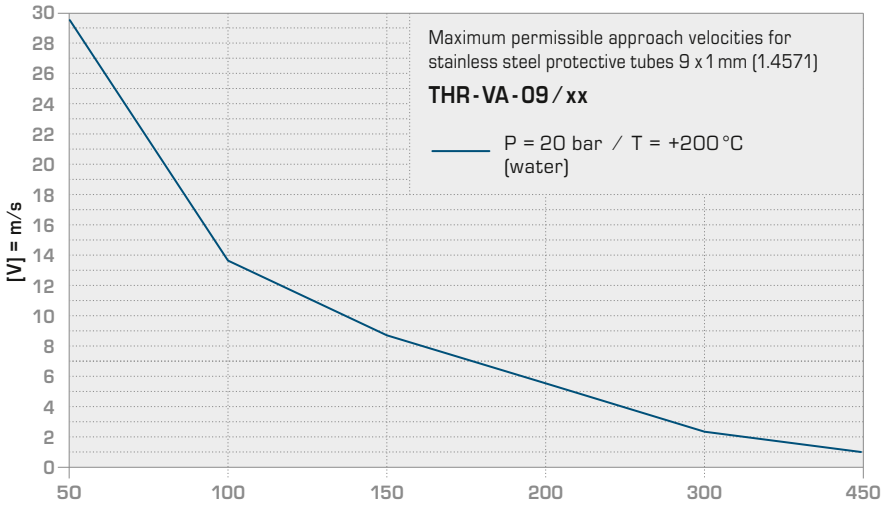
The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **THR-VA**) as well as for brass protective tubes (see graph **THR-ms**).

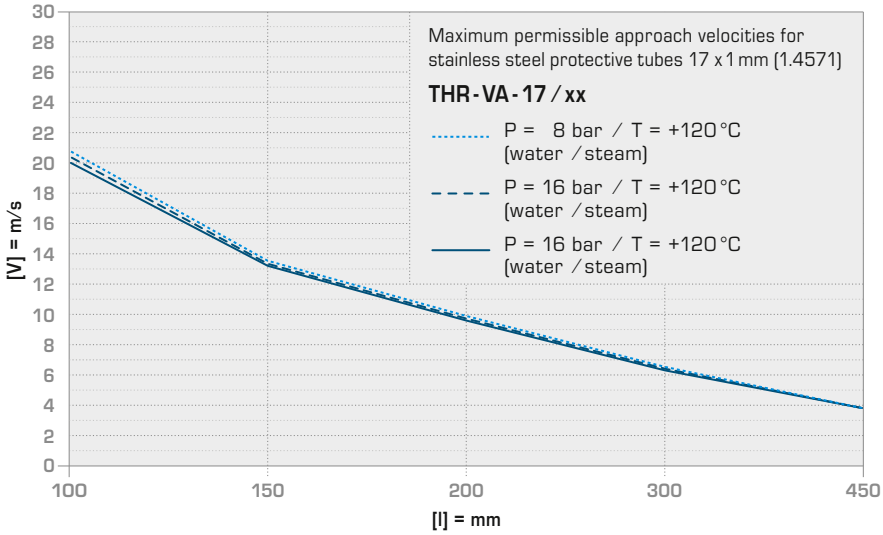
Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.



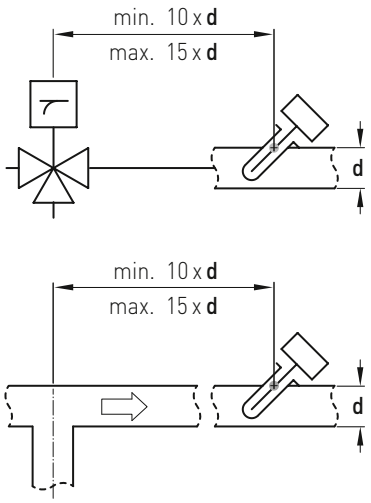


MIXING SECTION

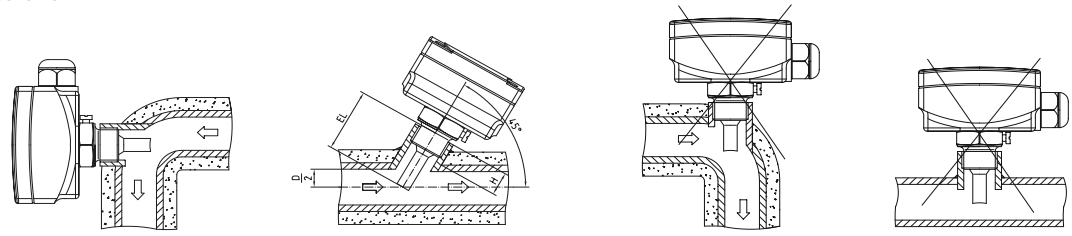
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



Mixing section **THR**



Installation scheme **THR**

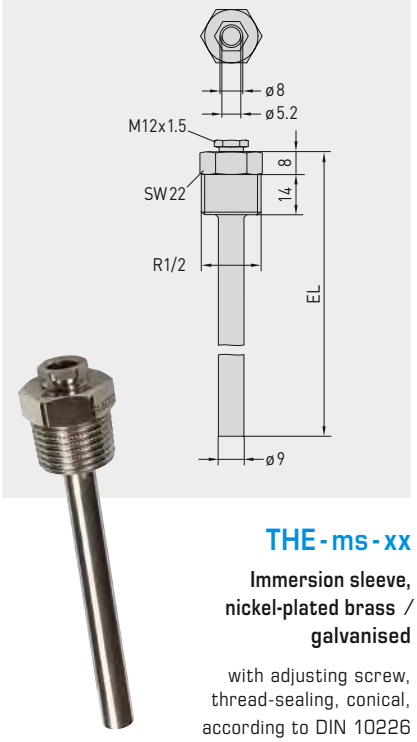


THERMASGARD® THE

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, with adjusting screw, for sleeve sensor HTF / HFTM

S+S REGELTECHNIK

Dimensional drawing **THE-ms-xx**

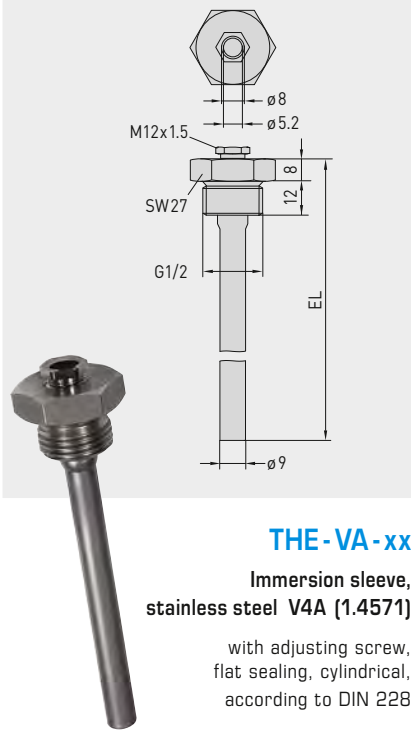


THE-ms-xx

Immersion sleeve, nickel-plated brass / galvanised

with adjusting screw, thread-sealing, conical, according to DIN 10226

Dimensional drawing **THE-VA-xx**



THE-VA-xx

Immersion sleeve, stainless steel V4A (1.4571)

with adjusting screw, flat sealing, cylindrical, according to DIN 228

When Copper and Zinc are Not Enough

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In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

THERMASGARD® THE Immersion sleeve Ø 9 mm for **THERMASGARD® HTF / HFTM**

Type / WG01	p_{max} static	T_{max}	Inserted Length (EL)	Item No.	Price
THE-ms / xx	**Brass nickel-plated / galvanised**			**Ø 9** x 1,0 mm	
THE-MS 50MM	16 bar	+130 °C	**50 mm**	7100-0011-6010-002	**10,77 €**
THE-MS 100MM	16 bar	+130 °C	**100 mm**	7100-0011-6020-002	**11,64 €**
THE-MS 150MM	16 bar	+130 °C	**150 mm**	7100-0011-6030-002	**12,07 €**
THE-MS 200MM	16 bar	+130 °C	**200 mm**	7100-0011-6040-002	**12,92 €**
THE-MS 250MM	16 bar	+130 °C	**250 mm**	7100-0011-6050-002	**14,47 €**
THE-VA / xx	**Stainless steel V4A** (1.4571)			**Ø 9** x 1,0 mm	
THE-VA 50MM	40 bar	+200 °C	**50 mm**	7100-0012-6010-002	**21,32 €**
THE-VA 100MM	40 bar	+200 °C	**100 mm**	7100-0012-6020-002	**23,55 €**
THE-VA 150MM	40 bar	+200 °C	**150 mm**	7100-0012-6030-002	**25,29 €**
THE-VA 200MM	40 bar	+200 °C	**200 mm**	7100-0012-6040-002	**26,67 €**
THE-VA 250MM	40 bar	+200 °C	**250 mm**	7100-0012-6050-002	**33,15 €**
THE-VA 300MM	40 bar	+200 °C	**300 mm**	7100-0012-6060-002	**34,63 €**
THE-VA 400MM	40 bar	+200 °C	**400 mm**	7100-0012-6080-002	**35,75 €**
Ordering example:	THE-ms-**150** (Brass immersion sleeve, Ø = 9 mm, **EL = 150** mm) THE-VA-**150** (Stainless steel immersion sleeve, Ø = 9 mm, **EL = 150** mm) Other inserted lengths on request				
Note:	inner diameter of socket 5.2 mm, with **adjusting screw** M12 x 1.5				

THERMASGARD® THE

Immersion sleeves made of stainless steel or brass, nickel-plated / galvanised, with adjusting screw, for sleeve sensor HTF / HFTM

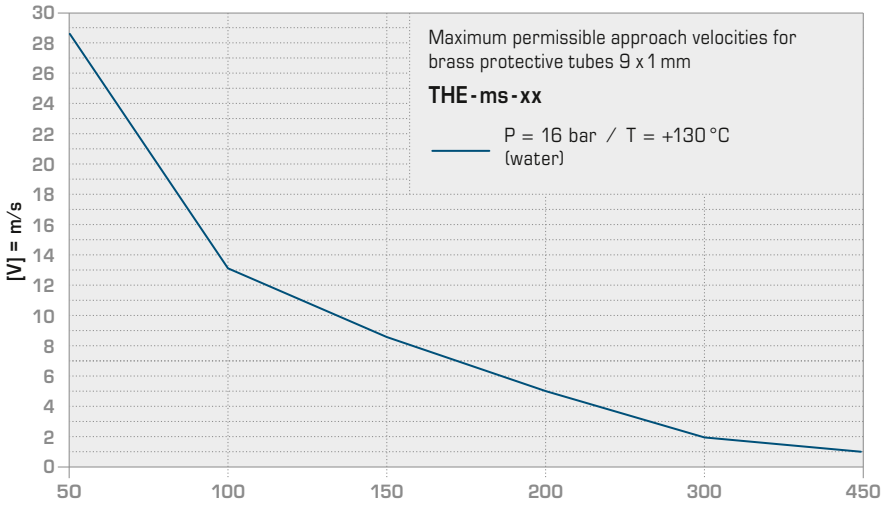
INSTRUCTIONS FOR PLANNING AND INSTALLATION

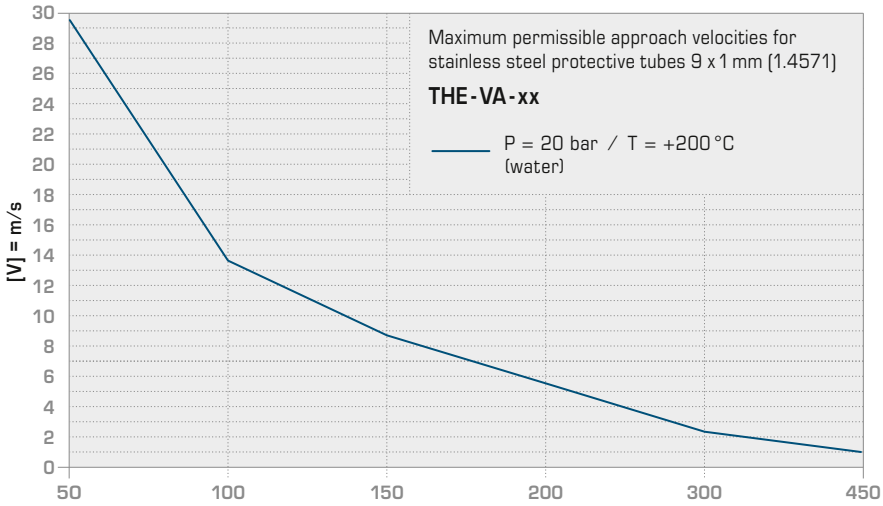
The approaching flow causes the protective tube to vibrate.

If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **THE-VA**) as well as for brass protective tubes (see graph **THE-ms**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

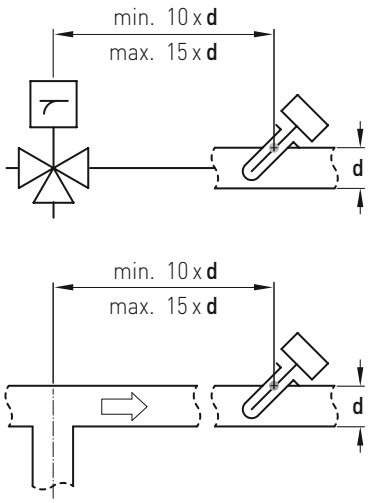




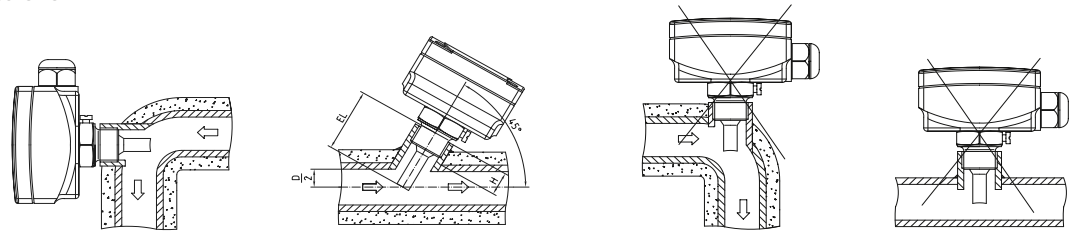
MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

Mixing section **THE**

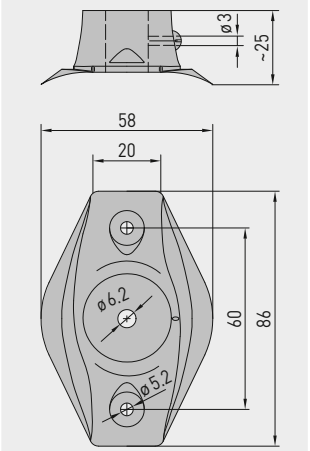


Installation scheme **THE**

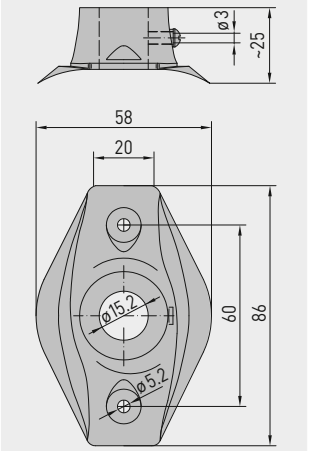


Mounting flange, plastic
Capillary tube gland bracket

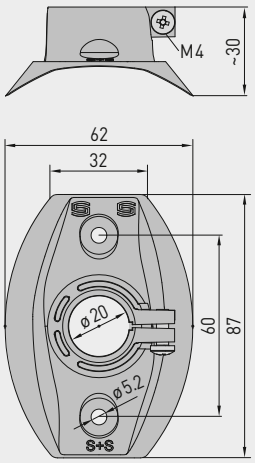
Dimensional drawing **MF-06-K**



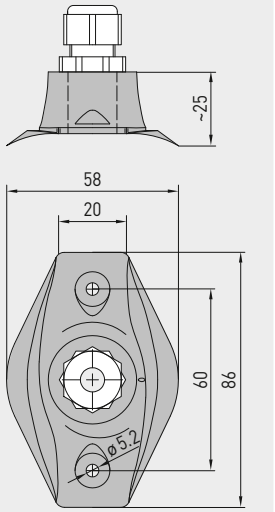
Dimensional drawing **MF-15-K**



Dimensional drawing **MFT-20-K**



Dimensional drawing **KRD-04**



MF-06-K
Mounting flange, plastic

MF-15-K
Mounting flange, plastic

MFT-20-K
Mounting flange, plastic

KRD-04
Capillary tube gland bracket, plastic





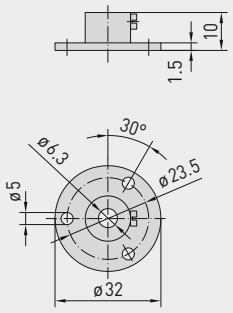




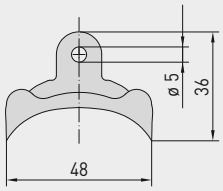
Type / WG01	Mounting flange, plastic	Tube Gland	T_{max}	Item No.	Price
MF-xx-K	for **metal** protective tubes!				
MF-06-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for rod sensors **MWTF / MWTM**	Ø 6.2 mm	+100 °C	7100-0030-1000-000	**6,30 €**
MF-10-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct air flow monitors **KLGF / KLSW**	Ø 10.2 mm	+100 °C	7100-0031-1000-000	**9,85 €**
MF-14-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct humidity sensors **KFF / KFTF** and pendulum room humidity sensors **RPFF / RPFTF** as well as for duct air flow monitors **KLGF / KLSW**	Ø 14.2 mm	+100 °C	7100-0030-2000-000	**9,85 €**
MF-15-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for temperature sensors **TF** (series Tyr 1) and temperature measuring transducers **TM** (series Tyr 1)	Ø 15.2 mm	+100 °C	7100-0032-0000-000	**6,30 €**
MF-20-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct sensors **KH**	Ø 20.2 mm	+100 °C	7100-0030-4000-000	**9,85 €**
MFT-20-K	for **PLEUROFORM** multi-channel pipes!				
MFT-20-K	Mounting flange, plastic, approx. 62 x 87 x 30 mm for duct sensors (series Tyr 1 / Tyr 2)	Ø 20 mm	+100 °C	7000-0031-0000-000	**9,85 €**

Type / WG01	Capillary tube gland bracket	Item No.	Price
KRD-04	Capillary tube gland bracket, plastic, approx. 58 x 86 x 25 mm (M 16 x 1.5) for frost protection thermostats (e.g. for air ducts) and rod sensors **MWTF / MWTM**	7100-0030-7000-000	**9,18 €**

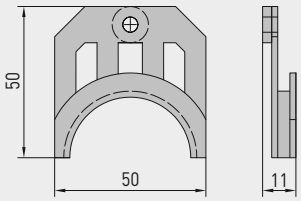
Dimensional drawing **MF-06-M**



Dimensional drawing **MK-05-M**



Dimensional drawing **MK-05-K**



MF-06-M

Mounting flange, metal



MK-05-M

Galvanised steel mounting clamps



MK-05-K

Mounting clamps, plastic

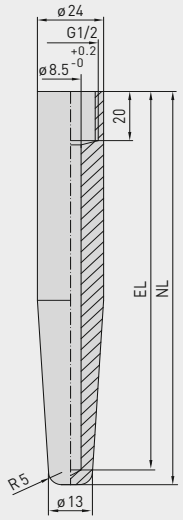


Type / WG01	Mounting flange, metal	Tube Gland	T_{max}	Item No.	Price
MF-xx-M	for **metal** protective tubes!				
MF-06-M	Mounting flange, metal (galvanised steel), Ø 32 mm, for temperature sensors **TF** (form B) temperature measuring transducers **TM** (form B), rod sensors **MWTF / MWTM**	Ø 6.3 mm	+700 °C	7100-0030-5000-100	**12,95 €**

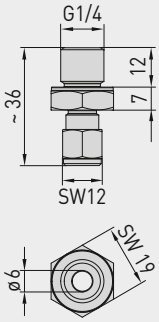
Type / WG01	Mounting clamps	Item No.	Price
MK-05-M	Galvanised steel **mounting clamps** (6 pieces) for rod sensors **MWTF / MWTM**	7100-0034-0000-000	**10,18 €**
MK-05-K	Plastic **mounting clamps** (6 pieces) for frost protection thermostats	7100-0034-1000-000	**10,18 €**

Mounting accessories for Immersion sensor

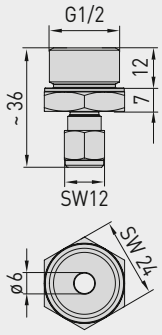
Dimensional drawing **ESSH**



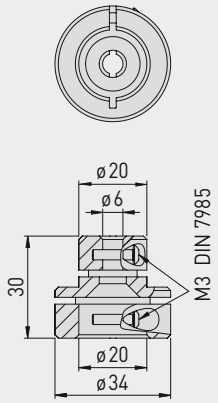
Dimensional drawing **KVSS**



Dimensional drawing **KVST**



Dimensional drawing **TH-ADAPTER-HW**



ESSH

Welding protective sleeve



KVSS

Clamp union with cutting ring



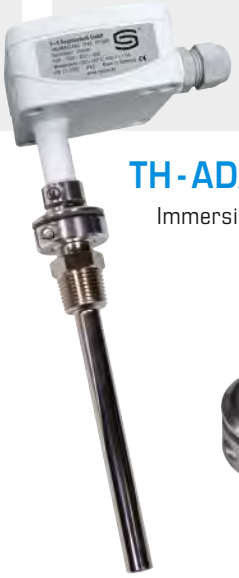
KVST

Clamp union with clamp ring



TH-ADAPTER-HW

Immersion sleeve adapter, metal



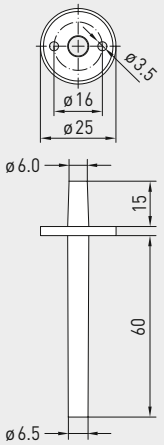


Type / WG01	Welding protective sleeve	Item No.	Price
	Welding protecting sleeves, G ½" straight internal pipe thread, stainless steel **V4A** (1.4571), other materials on request,		
ESSH 100MM	for immersion sleeves (EL) = 100 mm, P_{max} = 100 bar	7100-0052-0020-001	**70,94 €**
ESSH 150MM	for immersion sleeves (EL) = 150 mm, P_{max} = 100 bar	7100-0052-0030-001	**81,44 €**
ESSH 200MM	for immersion sleeves (EL) = 200 mm, P_{max} = 100 bar	7100-0052-0040-001	**91,92 €**

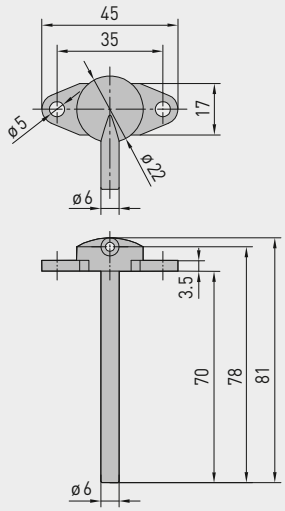
Type / WG01	Clamp union	Item No.	Price
KVST	**Clamp union** with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000	**100,92 €**
KVSS	**Clamp union** with cutting ring VA, Ø 6 mm	7100-0032-1000-000	**65,03 €**

Type / WG01	Immersion sleeve adapter, metal	Item No.	Price
TH-ADAPTER-HW	Metal immersion sleeve adapter (adaptation Ø 20 mm / Ø 6 mm) for mounting S+S temperature sensors from the TF and TM series in immersion sleeves by Honeywell / CentraLine of the types VFFT, VFL, VFNT, VFLN	7100-0037-0001-000	**15,95 €**

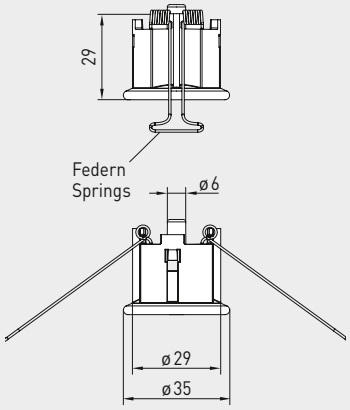
Dimensional drawing **ASD-06**



Dimensional drawing **ASD-07**



Dimensional drawing **DAL**



ASD-06

Connection set
(straight nipples)



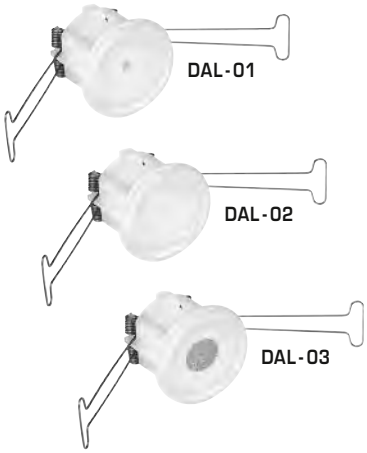
ASD-07

Connection nipples
(at 90 degree angle)



DAL

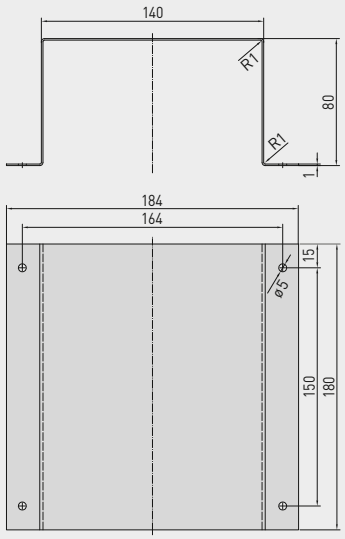
Pressure outlet



Type / WG01	Accessories for differential pressure switches	Item No.	Price
ASD-06	**Connection set** consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant), 4 Philips head screws (no pre-drilling required)	7100-0060-3000-000	**7,87 €**
ASD-07	**2 connection nipples** (at 90 degree angle) made of ABS	7100-0060-7000-000	**7,87 €**
ASS-UV 100M	**Connecting hose**, UV-resistant, Ø 6 mm, 1 roll (100 m)	7100-0060-3101-000	**1.666,89 €**
DAL-01	**Pressure outlet** for ceiling and in-wall installation as a pressure reference point, Ø 6 mm	7300-0060-3000-001	**36,84 €**
DAL-02	for hose attachment, Ø 6 mm	7300-0060-3000-100	**36,84 €**
DAL-03	as a pressure reference point, with sinter filter made of stainless steel **V4A** (1.4404), Ø 6 mm	7300-0060-3000-200	**69,00 €**

Type / WG01	Accessories for differential pressure switches DS1, DS2	Item No.	Price
DS-MW-Z	Sheet steel **mounting angle** in **Z-Form**	7100-0063-0000-000	**13,76 €**
DS-MW-L	Sheet steel **mounting angle** in **L-Form**	7100-0063-1000-000	**14,08 €**
DS-MW-U	Sheet steel **mounting angle** in **U-Form**	7100-0060-9000-000	**17,31 €**

Dimensional drawing **WS-01**

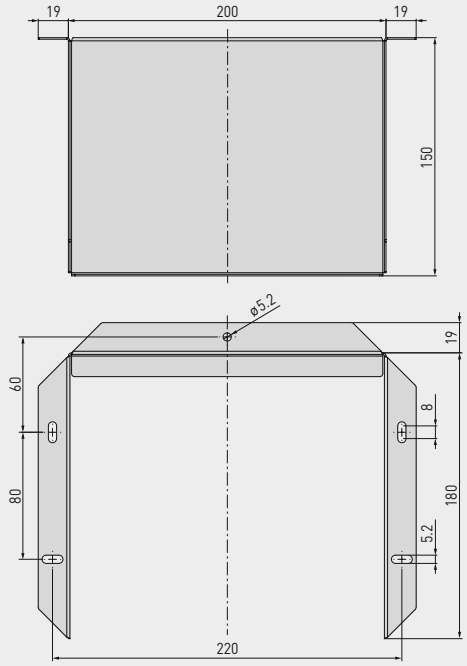


WS-01

Sun and
ball-impact protection hood

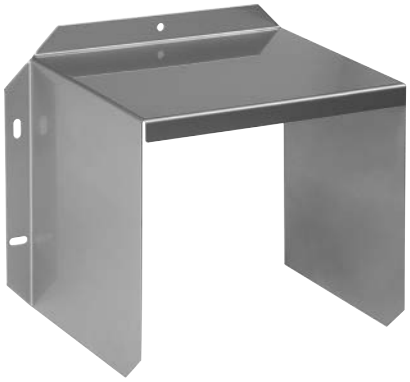


Dimensional drawing **WS-03**

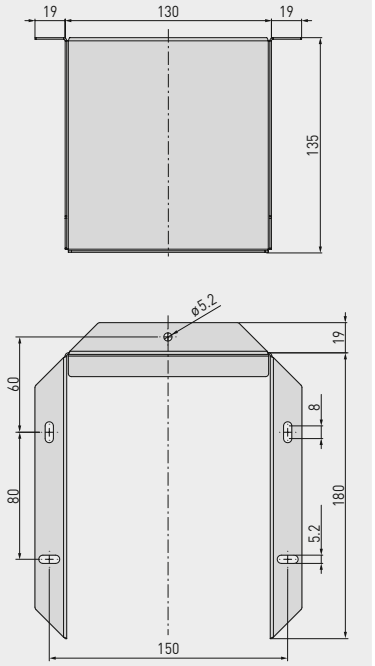


WS-03

Weather and
sun protection hood



Dimensional drawing **WS-04**



WS-04

Weather and
sun protection hood

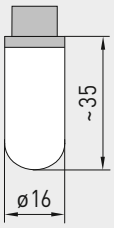


Type / WG01	Protection hoods	Item No.	Price
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**32,72 €**
WS-03	**Weather and sun protection hood,** 200 x 180 x 150 mm, stainless steel **V2A** (1.4301)	7100-0040-6000-000	**46,08 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**38,61 €**

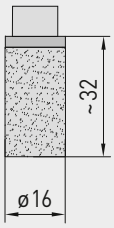
HS-Adapter



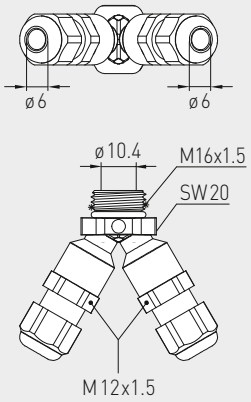
Dimensional drawing **SF-K**



Dimensional drawing **SF-M**



Dimensional drawing **MODBUS-Y**



HS-Adapter

Universal holder
for small housing
on top-hat rails



SF-K

Plastic sinter filter



SF-M

Metal sinter filter



MODBUS-Y

Y-Adapter als Bypass
für Busanschluss



Type / WG01	Spare parts, small parts and special accessories	Item No.	Price
SF-K	**Plastic sinter filter**, Ø 16 mm, L = 35 mm, exchangeable for humidity sensors	7000-0050-2310-000	**13,25 €**
SF-M	**Metal sinter filter**, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404) for humidity sensors	7000-0050-2200-100	**43,60 €**
PSW-09	1 set of **stainless steel paddles** 1-8" (4 pieces), 29 x 34/60/89/157 mm for flow monitors SW	7700-0010-1000-000	**19,80 €**
PWFS-08	**Stainless steel vane** for vane switch WFS	7700-0010-2000-000	**19,17 €**
WH-20	**Wall bracket** for duct hygrostats KH	1200-0010-4000-000	**12,84 €**
HS-ADAPTER	**Universal holder for small housings** made from plastic PA6, black, for installation on 35mm top-hat rails, incl. fixing screws	7100-0038-0000-000	**22,96 €**
SPB1	**Strap** for surface-contact sensors	7100-0035-0000-000	**3,89 €**
WLP-1	**Heat-conductive paste**, silicone-free (2 ml)	7100-0060-1000-000	**4,79 €**
MODBUS-Y	**Y-adapter** for cable gland M16x 1.5 (on 2x M12x 1.5), made of plastic	7000-0005-0002-100	**10,84 €**

Special accessories for M12 connector
5-pin / 12-pin, A coded,
Circular connector with screw-locking according to DIN EN 61076-2-101

S+S REGELTECHNIK

AL xx
Connecting cable
with cable socket

VL xx
Interconnecting cable
with cable socket
and cable connector

KB xx
Cable socket
without cable





5-pin



12-pin



Connecting cable for M12 connector	Type / WG01I	Cable length	Item No.	Price
PVC cable, **5-pin, shielded**, with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm, and one open cable end	**ALG xx A5F**		**5-pin, shielded**	
	ALG M12-A5F PVC 2M	**2 m**	2000-9121-0000-031	**28,26 €**
	ALG M12-A5F PVC 5M	**5 m**	2000-9121-0000-041	**36,24 €**
	ALG M12-A5F PVC 10M	**10 m**	2000-9121-0000-051	**49,89 €**
PVC cable, **5-pin,** unshielded, with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm, and one open cable end	**AL xx A5F**		**5-pin,** unshielded	
	AL M12-A5F PVC 2M	**2 m**	2000-9121-0000-001	**19,37 €**
	AL M12-A5F PVC 5M	**5 m**	2000-9121-0000-011	**23,99 €**
	AL M12-A5F PVC 10M	**10 m**	2000-9121-0000-021	**31,30 €**
PVC cable, **12-pin,** unshielded, with cable socket (M12, A coded, female), approx. Ø = 15 mm, L = 35 mm, and one open cable end	**AL xx A12F**		**12-pin,** unshielded	
	AL M12-A12F PVC 2M	**2 m**	2000-9122-0000-001	**62,14 €**
	AL M12-A12F PVC 5M	**5 m**	2000-9122-0000-011	**73,52 €**
	AL M12-A12F PVC 10M	**10 m**	2000-9122-0000-021	**92,85 €**

Interconnecting cable for M12 connector	Type / WG01I	Cable length	Item No.	Price
PVC cable, **5-pin, shielded**, with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	**VLG xx A5**		**5-pin, shielded**	
	VLG M12-A5 PVC 2M	**2 m**	2000-9111-0000-031	**60,79 €**
	VLG M12-A5 PVC 5M	**5 m**	2000-9111-0000-041	**68,87 €**
	VLG M12-A5 PVC 10M	**10 m**	2000-9111-0000-051	**82,70 €**
PVC cable, **5-pin,** unshielded, with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	**VL xx A5**		**5-pin,** unshielded	
	VL M12-A5 PVC 2M	**2 m**	2000-9111-0000-001	**34,58 €**
	VL M12-A5 PVC 5M	**5 m**	2000-9111-0000-011	**39,10 €**
	VL M12-A5 PVC 10M	**10 m**	2000-9111-0000-021	**48,83 €**
PVC cable, **12-pin,** unshielded, with cable socket (M12, A coded, female) and cable connector (M12, A coded, male) approx. Ø = 15 mm, L = 35 mm	**VL xx A12**		**12-pin,** unshielded	
	VL M12-A12 PVC 2M	**2 m**	2000-9112-0000-001	**129,68 €**
	VL M12-A12 PVC 5M	**5 m**	2000-9112-0000-011	**142,51 €**
	VL M12-A12 PVC 10M	**10 m**	2000-9112-0000-021	**163,96 €**

Mounting accessories for M12 connector	Type / WG02	Contact	Item No.	Price
Cable socket (M12, A coded, female), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	**KB xx**		**female**	
	KB M12-A5	**5-pin**	7100-0070-0712-000	**23,81 €**
	KB M12-A12	**12-pin**	7100-0070-0714-000	**71,06 €**
Cable connector (M12, A coded, male), approx. Ø = 20 mm, L = 54 mm, unassembled, without cable	**KS xx**		**male**	
	KS M12-A5	**5-pin**	7100-0070-0716-000	**23,81 €**
	KS M12-A12	**12-pin**	7100-0070-0718-000	**71,06 €**

Special accessories for M8 connector
4-pin, EtherCATP coded,
for industrial EtherCATP applications

ALG ECATP xx

Connecting cable
with one cable connector



VLG ECATP xx

Interconnecting cable
with two cable connectors



EtherCAT P



Connecting cable for EtherCATP	Type / WG02	Cable length	Item No.	Price
PUR cable, 4-pin, **shielded**, **with one cable connector** (M8, EtherCATP coded) and one open cable end	**ALG ECATP xx**		shielded	
	ALG ECATP 0.5m	**0.5 m**	2000-9131-0000-001	**40,74 €**
	ALG ECATP 1m	**1.0 m**	2000-9131-0000-011	**44,43 €**
	ALG ECATP 2m	**2.0 m**	2000-9131-0000-021	**48,02 €**
	ALG ECATP 5m	**5.0 m**	2000-9131-0000-031	**72,90 €**

Interconnecting cable for EtherCATP	Type / WG02	Cable length	Item No.	Price
PUR cable, 4-pin, **shielded**, **with two cable connectors** (M8, EtherCATP coded)	**VLG ECATP xx**		shielded	
	VLG ECATP 0.5m	**0.5 m**	2000-9131-0000-041	**65,91 €**
	VLG ECATP 1m	**1.0 m**	2000-9131-0000-051	**71,36 €**
	VLG ECATP 2m	**2.0 m**	2000-9131-0000-061	**82,42 €**
	VLG ECATP 5m	**5.0 m**	2000-9131-0000-071	**115,65 €**

Optional services

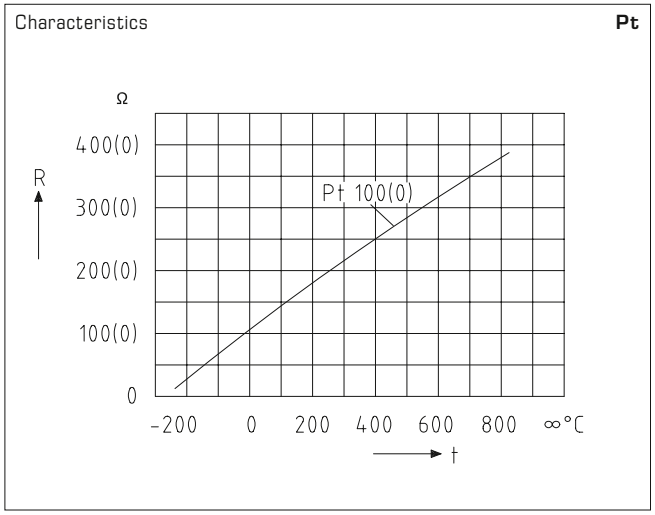
Individual components / WG01		Item No.	Price
FET		7100-0022-4000-000	**52,46 €**
KTY 81-210		7100-0022-0000-000	**4,97 €**
LM235Z	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000	**7,99 €**
NI1000	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000	**9,51 €**
NI1000TK5000	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000	**13,38 €**
NTC 1,8 KOHM	NTC 1.8 K	7100-0021-2000-000	**11,68 €**
NTC 10 KOHM PRECON	NTC 10 K Precon	7100-0021-9000-000	**6,11 €**
NTC 20 KOHM	NTC 20 K	7100-0021-6000-000	**6,11 €**
NTC 30 KOHM	NTC 30 K	7100-0021-7000-000	**6,11 €**
NTC 50 KOHM	NTC 50 K	7100-0021-8000-000	**6,11 €**
PT100 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-1000-000	**7,34 €**
PT100 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-2000-000	**9,76 €**
PT100 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-3000-000	**11,36 €**
PT1000 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-5000-000	**9,91 €**
PT1000 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-6000-000	**11,22 €**
PT1000 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-7000-000	**13,05 €**
PT1000 1/10 DIN	(according to DIN EN 60751, class B)	7100-0020-8000-000	**40,86 €**
Note:	Other sensors on request.		

Optional services / WG01		Unit	Price
Double sensor		**plus 50 %** of instrument price	
1 / 2 DIN	(according to DIN EN 60751, class B)	Per piece	**7,58 €**
1 / 3 DIN	(according to DIN EN 60751, class B)	Per piece	**7,58 €**
1 / 10 DIN	(according to DIN EN 60751, class B)	Per piece	**30,28 €**
Connection type	**4-wire connection** with ceramic base, head form B	Per piece	**6,30 €**
	4-wire connection with circuit board, box head	Per piece	**3,79 €**
Protection class	**IP 65** at head form B	Per piece	**9,72 €**
	IP 68 (Sensor sleeve watertight compound-filled) for cable sensors	Per piece	**3,50 €**

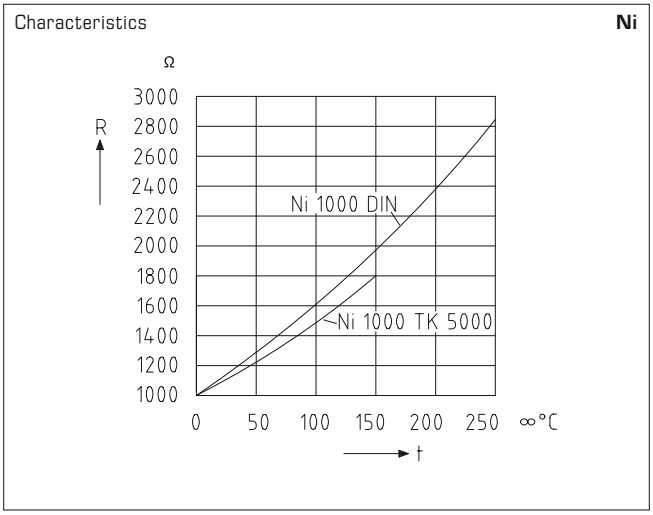
Custom-made products (for 25 or more pieces)			Unit	Price
Silicone-free sensor production			Per piece	on request!
Factory test certificate	1-point certificate		One-time cost	on request!
(per device)	2-point certificate		One-time cost	on request!
	3-point certificate		One-time cost	on request!
	Each additional test point		One-time cost	on request!
Custom-made products	Setup costs for custom-made products		One-time cost	on request!
Special paintwork	Set-up costs for special paintwork		one-off (net)	**195,38 €**
	plus costs for special paintwork	**from 25 piece**	per piece	**18,82 €**
		from 50 piece	per piece	**13,68 €**
Special print	Set-up costs incl. stereotype production, **1 colour**		one-off (net)	**195,38 €**
(with stereotype)	Set-up costs incl. stereotype production, **2 colour**		one-off (net)	**299,18 €**
	plus costs for special print	**from 25 piece**	per piece / colour	**11,86 €**
		from 50 piece	per piece / colour	**8,00 €**
		from 100 piece	per piece / colour	**6,43 €**
		from 250 piece	per piece / colour	**4,88 €**
		from 500 piece	per piece / colour	**2,44 €**
Printing customer logo on housing cover	Setup costs for printing on housing cover		One-time cost	on request!
(for 200 covers of one housing series)	Plus printing costs, 2-colour, printing on housing cover		Per piece	on request!
Labelling with customer logo	Setup costs for labelling		One-time cost	on request!
	Plus costs for labelling		Per piece	on request!

Characteristics and wiring of terminal connections of some passivee temperature sensors

Characteristics **Pt**

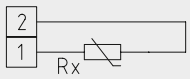


Characteristics **Ni**



Wiring of terminal connections room devices and box head

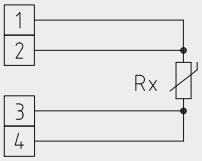
Connecting diagram **1 x two-wire connection standard**



Connecting diagram **1 x two-wire connection LM 235 Z (KP 10)**

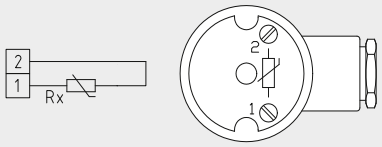


Connecting diagram **1 x four-wire connection** (optional)

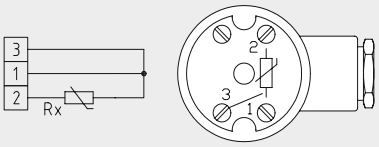


Wiring of terminal connections head form B

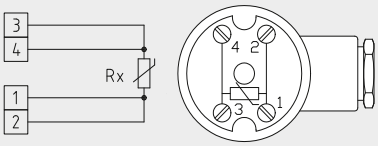
Connecting diagram **1 x two-wire connection**



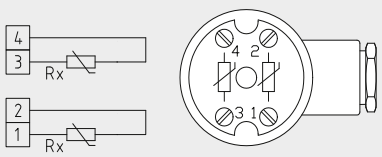
Connecting diagram **1 x three-wire connection**



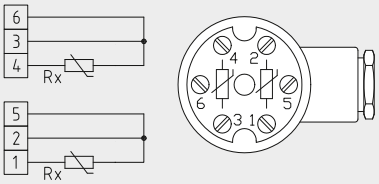
Connecting diagram **1 x four-wire connection**



Connecting diagram **2 x two-wire connection**



Connecting diagram **2 x three-wire connection**



Sensor type	Manufacturer *	RTF	ATF	TF 65 + MF-15-K	TF 65 + TH 08	ALTF	HTF
10K3A1 NTC 10 kOhm	**Aquatrol**	●	●	●	●	●	●
	Honeywell	T 8120 B	T 7416 A T 7043 E	●	T 7106 A T 7043 F	T 7044 C	T 7076 D
	Johnson	●	●	TE-6361 V TE-636 GV-1	●	●	●
	Satchwell	●	DOT 10 K2 DOS 10 K2	DDT 10 K1	DWT 10 K1 DST 10 K1	●	●
	Seachange	SEN / PTR / ROM	SEN / PR / OAT	SEN / PR / DCT	SEN / PR / IMM	SEN / PR / CLP	SEN / FL
	Trend	TE-TS	TE-TO	TE-TD	TE-TI	TE-TC	●
10K4A1 NTC 10 kOhm Precon	**Andover**	TTS-S Series	●	TT-O Series	TT-I Series	TT-ST	●
	Delta Controls	●	●	●	●	●	●
	Siebe	●	●	●	●	●	●
	York (< 40°C)	●	●	●	●	●	●
20K6A1 NTC 20 kOhm	**Honeywell**	T 7460 H T 7470 A DRF 20-S RF 20 T 4712	AF 20 DAF 20 T 7416 A1022	LF 20	VF 20 T VF 20 NT VF 20 L VF 20 LN WPF 20 T 7425 A	VF 20 A WPF 20 A	KFT 20 KFT 20 B DKF 20
PT 100 DIN EN 60 751 Klasse B	**Sauter**	EGT 430 / F 011	●	EGT 466 / F 011 EGT 447 / F 011	●	●	EGT 456 / F 011
	Serck	●	●	●	●	●	●
	Siemens / Landis & Staefa	QAA 100 QAA 2010	QAC 2010	FK-TP / 200 QAM 2110	QAE 2110	QAD 2010	QAP 2010
PT 1000 DIN EN 60 751 Klasse B	**Honeywell**	T 7412	T 7416 A1014	T 7411	T 7413	T 7414	●
	Sauter	EGT 430 / F 101	EGT 401 / F 101	EGT 446 / F 101 EGT 447 / F 101	–	EGT 411 / F 101	EGT 456 / F 101
	Serck	●	●	●	●	●	●
	Siebe	TS-5811	●	●	●	●	●
	Cylon	●	●	●	●	●	●
Ni 1000 DIN EN 43 760	**Sauter**	EGT 330 / F 101	EGT 301 / F 101	EGT 346 / F 101 EGT 347 / F 101 EGT 348 / F 101	EGT 346 / F 101 EGT 347 / F 101 EGT 348 / F 101	EGT 311 / F 101	EGT 354 / F 101 EGT 356 / F 101
Ni 1000 / TCR Ni1000 TK 500	**Siemens / Landis & Staefa**	QAA 24 QAA 25 QAA 26 QAA 27 QAA 64	QAC 22	QAM 2120	QAE 2120	QAD 22 QAD 26	QAP 21 QAP 22 QAZ 21
SAT 1	**Satchwell**	DRT DU, DUS, DUSF	DOT 0002 DOS 0002	DDT 0001	DWT 0001 DST 0001	●	DDU
FeT (T1)	**Landis & Staefa**	QAA 2040 FR-T1	FW-T1	QAM 2140 FK-T1	QAE 2140 FT-T1	FA-T1	QAP 2040 FTK-T1
TAC 1 NTC 1.8 kOhm	**TAC Schneider**	●	●	●	●	●	●
2.2 K3 A1 NTC 2.2 kOhm	**Ambiflex**	RTN 3060	ETN 3060	DTN 3060	ITN 3060	CTN 3060	●
	Johnson	TE-6344 P	TE-6343 P	TE-6341 P TE-6341 V TE-634 GV-1	TE-6342 P	–	–
3 K3 A1 NTC 3 kOhm	**Alerton**	MS-1000 Series TS-1050	●	●	●	●	●
3 K6 A1 NTC 30 kOhm	**Drayton**	A 701	A 702	●	A 703	A 704	●
LM235Z (KP10)	**Kieback & Peter**	TR TD	TA TAD	TLS TLD	TV, TVD TDN, TVP	TAV TAVD	TEV TKV

* Manufacturer names are brands and / or trademarks of the respective companies.

Sensor type (+)
Thermistor elements with positive temperature coefficient –
Temperature ranges (temperature/resistance)

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FeT (T1)		**KTY 81-210**		**LM 235 Z** (KP10)		**Ni 1000** according to DIN EN 43760 TCR= 6180 ppm/K		**Ni 1000 - TK 5000** (LG-Ni 1000) TCR= 5000 ppm/K		**PT 100** according to DIN EN 60751 TCR= 3850 ppm/K		**PT 1000** according to DIN EN 60751 TCR= 3850 ppm/K	
°C	Ω	°C	Ω	°C	mV	°C	Ω	°C	Ω	°C	Ω	°C	Ω
– 50	–	**– 50**	1030	**– 50**	–	**– 50**	743	**– 50**	790.8	**– 50**	80.3	**– 50**	803
– 40	–	– 40	1135	– 40	2330	– 40	791	– 40	826.8	– 40	84.3	– 40	843
– 30	1935	– 30	1247	– 30	2430	– 30	842	– 30	871.7	– 30	88.2	– 30	882
– 20	2030	– 20	1367	– 20	2530	– 20	893	– 20	913.4	– 20	92.2	– 20	922
– 15	2078	– 15		– 15	2580	– 15	920	– 15	934.7	– 15	94.1	– 15	941
– 10	2027	– 10	1495	– 10	2630	– 10	946	– 10	956.2	– 10	96.1	– 10	961
– 5	2176	– 5		– 5	2680	– 5	973	– 5	978.0	– 5	98.0	– 5	980
0	2226	0	1630	0	2730	0	1000	0	1000.0	0	100.0	0	1000
1	2236	1		1	2740	5	1028	1	1004.4	5	102.0	5	1020
2	2246	2		2	2750	10	1056	2	1008.9	10	103.9	10	1039
3	2256	3		3	2760	15	1084	3	1013.3	15	105.8	15	1058
4	2266	4		4	2770	20	1112	4	1017.8	20	107.8	20	1078
5	2276	5		5	2780	25	1142	5	1022.3	25	109.8	25	1098
6	2286	6		6	2790	30	1171	6	1026.7	30	111.7	30	1117
7	2298	7		7	2800	35	1200	7	1031.2	35	113.6	35	1136
8	2306	8		8	2810	40	1230	8	1035.8	40	115.5	40	1155
9	2316	9		9	2820	45	1261	9	1040.3	45	117.5	45	1175
10	2326	10	1772	10	2830	50	1291	10	1044.8	50	119.4	50	1194
11	2337	11		11	2840	55	1322	11	1049.3	55	121.3	55	1213
12	2347	12		12	2850	60	1353	12	1053.9	60	123.2	60	1232
13	2357	13		13	2860	65	1385	13	1058.4	65	125.2	65	1252
14	2367	14		14	2870	70	1417	14	1063.0	70	127.1	70	1271
15	2377	15		15	2880	75	1450	15	1067.6	75	129.0	75	1290
16	2388	16		16	2890	80	1483	16	1072.2	80	130.9	80	1309
17	2398	17		17	2900	85	1516	17	1076.8	85	132.8	85	1328
18	2408	18		18	2910	90	1549	18	1081.4	90	134.7	90	1347
19	2418	19		19	2920	95	1584	19	1086.0	95	136.6	95	1366
20	2429	20	1922	20	2930	100	1618	20	1090.7	100	138.5	100	1385
21	2439	21		21	2940	110	1688	21	1095.3	110	142.3	110	1423
22	2449	22		22	2950	120	1760	22	1100.0	120	146.1	120	1461
23	2460	23		23	2960	130	1833	23	1104.6	130	149.8	130	1498
24	2470	24		24	2970	140	1909	24	1109.3	140	153.6	140	1536
25	2480	25	2000	25	2980	150	1987	25	1114.0	150	157.3	150	1573
26	2491	26		26	2990	160	2066	26	1120.0	160	161.0	160	1611
27	2501	27		27	3000	170	2148	27	1123.4	170	164.8	170	1648
28	2512	28		28	3010	**180**	2232	28	1128.1	180	168.5	180	1685
29	2522	29		29	3020			29	1132.9	190	172.2	190	1722
30	2532	30	2080	30	3030			30	1137.6	200	175.8	200	1758
35	2585	35		35	3080			35	1161.5	210	179.5	210	1795
40	2638	40	2245	40	3130			40	1185.7	220	183.2	220	1832
45	2692	45		45	3180			45	1210.2	230	186.8	230	1868
50	2745	50	2417	50	3230			50	1235.0	240	190.5	240	1905
55	2800	55		55	3280			55	1260.1	250	194.1	250	1941
60	2855	60	2597	60	3330			60	1285.4	260	197.7	260	1977
65	2910	65		65	3380			65	1311.1	270	201.3	270	2013
70	2966	70	2785	70	3430			70	1337.1	280	204.9	280	2049
75	3022	75		75	3480			75	1363.5	290	208.5	290	2085
80	3079	80	2980	80	3530			80	1390.1	300	212.0	300	2121
85	3136	85		85	3580			85	1417.1	310	215.6	310	2156
90	3194	90	3182	90	3630			90	1444.4	320	219.1	320	2191
95	3252	95		95	3680			95	1472.0	330	222.7	330	2227
100	3311	100	3392	100	3730			100	1500.0	340	226.2	340	2262
105	3370	105		105	3780			105	1528.3	350	229.7	350	2297
110	3430	110	3607	110	3830			110	1557.0	360	233.2	360	2332
115	3491	115		115	3880			115	1586.0	370	236.7	370	2367
120	3552	120	3817	120	3930			**120**	1625.4	380	240.1	380	2401
125	3613	125	3915	125	3980					390	243.6	390	2436
130	3675	130	4008	130	–					**400**	247.0	**400**	2470
140	3802	140	4166	140	–								
150	3929	**150**	4280	**150**	–								

Sensor type (+)
Thermistor elements with positive temperature coefficient –
Temperature ranges (temperature/resistance)

Accuracy of passivee elements			
Sensor elements	Tolerance	Standard	Rated zero-power resistance
Pt 1000	± 0.3 K / 0 °C	DIN EN 60 751, class B	TK = 3850 ppm / K
Pt 1000 1/3 DIN	± 0.1 K / 0 °C	DIN EN 60 751, class A	TK = 3850 ppm / K
Pt 1000 A	± 0.15 K / 0 °C	DIN EN 60 751, class A, TGA	TK = 3850 ppm / K
Pt 1000 1/10 DIN	± 0.03 K / 0 °C	DIN EN 60 751, class A	TK = 3850 ppm / K
Pt 100	± 0.3 K / 0 °C	DIN EN 60 751, class B	TK = 3850 ppm / K
Pt 100 1/3 DIN	± 0.1 K / 0 °C	DIN EN 60 751, class A	TK = 3850 ppm / K
Ni 1000	± 0.4 K / 0 °C	DIN EN 43 760, class B	TCR = 6180 ppm / K
Ni 1000 1/2 DIN	± 0.2 K / 0 °C	DIN EN 43 760, class B	TCR = 6180 ppm / K
Ni 1000 TK5000	± 0.4 K / 0 °C		TCR = 5000 ppm / K
LM235Z, KP10	± 0.2 K / 25 °C	10 mV / K	
NTC 1.8K	± 0.3 K / 25 °C	B25 / 85 = 3499 K	R25 = 1.8 K ± 0.3 %
NTC 2.2K	± 0.3 K / 25 °C	B25 / 85 = 3610 K	R25 = 2.2 K ± 1 %
NTC 10K	± 0.3 K / 25 °C	B25 / 85 = 3977 K	R25 = 10 KOhm ± 1 %
NTC 10K Precon	± 0.3 K / 25 °C	B25 / 85 = 3695 K	R25 = 10 KOhm ± 1 %
NTC 10K Carell	± 0.3 K / 25 °C	B25 / 85 = 3435 K	R25 = 10 KOhm ± 1 %
NTC 20K	± 0.2 K / 25 °C	B25 / 85 = 4262 K	R25 = 20 KOhm ± 0.5 %

ATTENTION, NOTE !

Due to self-heating, the testing current has an influence on the measuring accuracy of the thermometer and should therefore never exceed the following:

Guide values for the testing current:

Maximum sensor current ..... I_{max}
Pt1000 (thin layer) ..... < 0.6 mA
Pt100 (thin layer) ..... < 1.0 mA
Ni1000 (DIN), Ni1000 TK5000 ..... < 0.3 mA
NTC xx ..... < 2.0 mW
LM235Z ..... 400 µA ... 5 mA
KTY 81 - 210 ..... < 2.0 mA

To avoid damage/errors, it is recommended to use shielded cables. It is imperative to avoid parallel laying of current-carrying lines. The EMC directives must be observed!

These devices must be installed by an authorised qualified expert!

Sensor type (–)
Thermistor elements with negative temperature coefficient –
Temperature ranges (temperature/resistance)

S+S REGELTECHNIK

NTC 1,8 kΩ R_{25} = 1.8 kΩ ±0,2K $B_{25/85}$ = 3499 K ±1%		NTC 2,2 kΩ R_{25} = 2.2 kΩ ±1% $B_{25/85}$ = 3610 K ±1%		NTC 3 kΩ R_{25} = 3 kΩ ±1% $B_{25/85}$ = 3977 K ±1%		NTC 5 kΩ R_{25} = 5 kΩ ±1% $B_{25/85}$ = 3977 K ±1%		NTC 10 kΩ R_{25} = 10 kΩ ±1% $B_{25/85}$ = 3977 K ±1%		NTC 10 kΩ Precon R_{25} = 10 kΩ ±1% $B_{25/85}$ = 3695 K ±1%		NTC 10 K e.g. Carell R_{25} = 10 kΩ ±1% $B_{25/85}$ = 3435 K ±1%	
°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
– 50	–	– 50	–	– 50	–	**– 50**	–	– 50	–	**– 50**	–	**– 50**	–
– 40	39073	– 40	–	– 40	–	– 40	–	– 40	–	– 40	–	– 40	–
– 30	22301	**– 30**	27886	**– 30**	53093	– 30	88488	– 30	175785	– 30	135200	– 30	111300
– 20	13196	– 20	16502	– 20	29125	– 20	48541	– 20	96597	– 20	78910	– 20	67770
– 15	10278	– 15	12844	– 15	21887	– 15	36479	– 15	72650	– 15	61020	– 15	53410
– 10	8069	– 10	10070	– 10	16599	– 10	27664	– 10	55142	– 10	47540	– 10	42470
– 5	6383	– 5	8134	– 5	12698	– 5	21163	– 5	42215	– 5	37310	– 5	33900
0	5085	0	6452	0	9795	0	16325	0	32590	0	29490	0	27280
1	4863	1	6164	1	9309	1	15515	1	30974	1	28156	1	26130
2	4652	2	5891	2	8849	2	14749	2	29448	2	26890	2	25030
3	4452	3	5631	3	8415	3	14025	3	28007	3	25687	3	23990
4	4261	4	5384	4	8005	4	13341	4	26645	4	24545	4	23000
5	4079	5	5150	5	7617	5	12695	5	25357	5	23460	5	22050
6	3906	6	4927	6	7251	6	12085	6	24138	6	22430	6	21150
7	3742	7	4715	7	6905	7	11508	7	22984	7	21451	7	20300
8	3585	8	4513	8	6575	8	10959	8	21892	8	20519	8	19480
9	3436	9	4321	9	6265	9	10442	9	20858	9	19633	9	18700
10	3294	10	4138	10	5971	10	9951	10	19880	10	18790	10	17960
11	3159	11	3964	11	5691	11	9485	11	18953	11	17987	11	17240
12	3030	12	3797	12	5427	12	9045	12	18074	12	17222	12	16560
13	2906	13	3639	13	5177	13	8628	13	17242	13	16494	13	15900
14	2789	14	3488	14	4938	14	8230	14	16452	14	15801	14	15280
15	2677	15	3345	15	4713	15	7855	15	15704	15	15140	15	14690
16	2570	16	3207	16	4500	16	7500	16	14992	16	14510	16	14120
17	2468	17	3076	17	4298	17	7163	17	14317	17	13910	17	13580
18	2371	18	2952	18	4104	18	6841	18	13676	18	13337	18	13060
19	2278	19	2832	19	3922	19	6536	19	13068	19	12791	19	12560
20	2189	20	2719	20	3747	20	6246	20	12491	20	12270	20	12090
21	2104	21	2610	21	3582	21	5970	21	11941	21	11773	21	11630
22	2023	22	2506	22	3426	22	5710	22	11418	22	11298	22	11200
23	1945	23	2407	23	3277	23	5462	23	10921	23	10845	23	10780
24	1871	24	2289	24	3135	24	5224	24	10450	24	10413	24	10380
25	1800	25	2200	25	3000	25	5000	25	10000	25	10000	25	10000
26	1732	26	2115	26	2872	26	4787	26	9572	26	9606	26	9632
27	1667	27	2034	27	2750	27	4583	27	9166	27	9229	27	9281
28	1605	28	1957	28	2634	28	4389	28	8778	28	8869	28	8944
29	1546	29	1883	29	2522	29	4203	29	8409	29	8525	29	8622
30	1489	30	1812	30	2417	30	4028	30	8058	30	8196	30	8313
35	1238	35	1500	35	1960	35	3266	35	6534	35	6754	35	6940
40	1034	40	1248	40	1597	40	2662	40	5329	40	5594	40	5827
45	869	45	1043	45	1310	45	2184	45	4371	45	4655	45	4911
50	733	50	876	50	1081	50	1801	50	3605	50	3893	50	4160
55	622	55	738	55	896	55	1493	55	2988	55	3270	55	3536
60	529	60	626	60	746	60	1244	60	2489	60	2760	60	3020
65	453	65	532	65	625	65	1042	65	2084	65	2338	65	2588
70	389	70	454	70	526	70	876	70	1753	70	1900	70	2228
75	335	75	390	75	444	75	740	75	1480	75	1700	75	1924
80	290	80	335	80	346	80	627	80	1256	80	1457	80	1668
85	252	85	289	85	321	85	535	85	1070	85	1254	85	1451
90	220	90	251	90	275	90	458	90	915	90	1084	90	1266
95	192	95	218	95	236	95	393	95	786	95	939	95	1108
100	169	100	190	100	204	100	339	100	678	100	817	100	973
105	148	105	167	105	176	105	294	105	586	105	713	105	857
110	131	**110**	146	110	138	110	255	110	509	110	624	110	758
115	116			115	120	115	223	115	445	115	548	115	671
120	103			120	105	120	195	120	389	120	482	120	597
125	92			125	92	125	171	125	341	125	426	125	531
				130	81	130	151	130	300	130	377	130	474
				140	64	140	118	140	234	140	298	140	381
				150	50	**150**	93	**150**	185	**150**	238	**150**	308

Sensor type (–)
Thermistor elements with negative temperature coefficient – Temperature ranges (temperature/resistance)

NTC 20 kΩ R_{25} = 20 kΩ ±0.5% $B_{25/85}$ = 4262 K ±1%		NTC 50 kΩ R_{25} = 50 kΩ ±1% $B_{25/85}$ = 4262 K ±1%		Satchwell SAT 1	
°C	Ω	°C	Ω	°C	Ω
– 50	–	– 50	–	**– 50**	9719
– 40	806800	**– 40**	2017000	– 40	9584
– 30	413400	– 30	1033500	– 30	9349
– 20	220600	– 20	551500	– 20	8968
– 15	163480	– 15	408700	– 15	8708
– 10	122260	– 10	305650	– 10	8396
– 5	92220	– 5	230550	– 5	8031
0	70140	0	175350	0	7614
1	66469	1	166173	1	7525
2	63011	2	157527	2	7434
3	59751	3	149378	3	7341
4	56678	4	141696	4	7246
5	53780	5	134450	5	7150
6	51041	6	127602	6	7053
7	48457	7	121142	7	6954
8	46018	8	115044	8	6853
9	43715	9	109287	9	6752
10	41540	10	103850	10	6649
11	39489	11	98723	11	6545
12	37550	12	93875	12	6440
13	35716	13	89291	13	6334
14	33982	14	84954	14	6228
15	32340	15	80850	15	6121
16	30782	16	76954	16	6013
17	29307	17	73269	17	5905
18	27912	18	69780	18	5786
19	26591	19	66478	19	5684
20	25340	20	63350	20	5580
21	24156	21	60389	21	5471
22	23033	22	57582	22	5362
23	21968	23	54921	23	5254
24	20958	24	52396	24	5147
25	20000	25	50000	25	5039
26	19090	26	47726	26	4933
27	18227	27	45566	27	4827
28	17406	28	43515	28	4721
29	16627	29	41567	29	4617
30	15886	30	39715	30	4513
35	12698	35	31745	35	4012
40	10212	40	25530	40	3545
45	8260	45	20650	45	3117
50	6718	50	16795	50	2730
55	5494	55	13735	55	2386
60	4518	60	11295	60	2082
65	3732	65	9330	65	1816
70	3098	70	7745	70	1585
75	2586	75	6465	75	1385
80	2166	80	5415	80	1213
85	1823	85	4558	85	1064
90	1541	90	3852	90	937
95	1308	95	3269	95	828
100	1114	100	2785	100	734
105	953	105	2382	105	654
110	818	110	2045	110	585
115	704	115	1761	115	525
120	609	120	1523	120	474
125	528	125	1321	125	429
130	460	130	1149	130	391
140	351	140	878	140	329
150	272	**150**	679	**150**	281

Sensor type (–)

Resistor element with
negative temperature coefficient,

also called negative temperature coefficient thermistor, or NTC thermistor.

To avoid damage/errors, it is recommended to use shielded cables. It is imperative to avoid parallel laying of current-carrying lines. The EMC directives must be observed!

These devices must be installed by an authorised qualified expert!

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THERMASGARD® TF 43

Temperature sensors (basic device)

Type / WG03B	Output	Item No.	Price
TF 43 PT 1000 xx	**passive**	**IP 54**	
TF43 Pt1000 50mm		1101-7010-5011-000	**29,12 €**
TF43 Pt1000 100mm		1101-7010-5021-000	**29,24 €**
TF43 Pt1000 150mm		1101-7010-5031-000	**30,18 €**
TF43 Pt1000 200mm		1101-7010-5041-000	**31,01 €**
TF43 Pt1000 250mm		1101-7010-5051-000	**32,60 €**
TF43 Pt1000 300mm		1101-7010-5061-000	**35,28 €**
TF43 Pt1000 350mm		1101-7010-5071-000	**36,36 €**
TF43 Pt1000 400mm		1101-7010-5081-000	**37,51 €**
TF 43 Ni1000 xx	**passive**	**IP 54**	
TF43 Ni1000 50mm		1101-7010-9011-000	**29,84 €**
TF43 Ni1000 100mm		1101-7010-9021-000	**32,66 €**
TF43 Ni1000 150mm		1101-7010-9031-000	**32,90 €**
TF43 Ni1000 200mm		1101-7010-9041-000	**33,62 €**
TF43 Ni1000 250mm		1101-7010-9051-000	**34,57 €**
TF43 Ni1000 300mm		1101-7010-9061-000	**36,84 €**
TF43 Ni1000 350mm		1101-7010-9071-000	**37,89 €**
TF43 Ni1000 400mm		1101-7010-9081-000	**39,59 €**
TF 43 Ni1000TK xx	**passive**	**IP 54**	
TF43 NiTK 50mm		1101-7011-0011-000	**29,89 €**
TF43 NiTK 100mm		1101-7011-0021-000	**32,72 €**
TF43 NiTK 150mm		1101-7011-0031-000	**33,06 €**
TF43 NiTK 200mm		1101-7011-0041-000	**33,76 €**
TF43 NiTK 250mm		1101-7011-0051-000	**34,68 €**
TF43 NiTK 300mm		1101-7011-0061-000	**36,99 €**
TF43 NiTK 350mm		1101-7011-0071-000	**38,14 €**
TF43 NiTK 400mm		1101-7011-0081-000	**39,74 €**
TF 43 LM235Z xx	**passive**	**IP 54**	
TF43 LM235Z 50mm		1101-7012-1011-000	**30,43 €**
TF43 LM235Z 100mm		1101-7012-1021-000	**30,76 €**
TF43 LM235Z 150mm		1101-7012-1031-000	**31,87 €**
TF43 LM235Z 200mm		1101-7012-1041-000	**32,60 €**
TF43 LM235Z 250mm		1101-7012-1051-000	**32,97 €**
TF43 LM235Z 300mm		1101-7012-1061-000	**35,80 €**
TF43 LM235Z 350mm		1101-7012-1071-000	**36,24 €**
TF43 LM235Z 400mm		1101-7012-1081-000	**38,50 €**
TF 43 NTC 1,8 K xx	**passive**	**IP 54**	
TF43 NTC1,8K 50mm		1101-7011-2011-000	**29,12 €**
TF43 NTC1,8K 100mm		1101-7011-2021-000	**30,69 €**
TF43 NTC1,8K 150mm		1101-7011-2031-000	**31,48 €**
TF43 NTC1,8K 200mm		1101-7011-2041-000	**32,21 €**
TF43 NTC1,8K 250mm		1101-7011-2051-000	**33,76 €**
TF43 NTC1,8K 300mm		1101-7011-2061-000	**34,88 €**
TF43 NTC1,8K 350mm		1101-7011-2071-000	**36,06 €**
TF43 NTC1,8K 400mm		1101-7011-2081-000	**36,99 €**
TF 43 NTC10K xx	**passive**	**IP 54**	
TF43 NTC10K 50mm		1101-7011-5011-000	**29,12 €**
TF43 NTC10K 100mm		1101-7011-5021-000	**30,69 €**
TF43 NTC10K 150mm		1101-7011-5031-000	**31,48 €**
TF43 NTC10K 200mm		1101-7011-5041-000	**32,21 €**
TF43 NTC10K 250mm		1101-7011-5051-000	**33,76 €**
TF43 NTC10K 300mm		1101-7011-5061-000	**34,88 €**
TF43 NTC10K 350mm		1101-7011-5071-000	**36,06 €**
TF43 NTC10K 400mm		1101-7011-5081-000	**36,99 €**
TF 43 NTC20K xx	**passive**	**IP 54**	
TF43 NTC20K 50mm		1101-7011-6011-000	**29,12 €**
TF43 NTC20K 100mm		1101-7011-6021-000	**30,69 €**
TF43 NTC20K 150mm		1101-7011-6031-000	**31,48 €**
TF43 NTC20K 200mm		1101-7011-6041-000	**32,21 €**
TF43 NTC20K 250mm		1101-7011-6051-000	**33,76 €**
TF43 NTC20K 300mm		1101-7011-6061-000	**34,88 €**
TF43 NTC20K 350mm		1101-7011-6071-000	**36,06 €**
TF43 NTC20K 400mm		1101-7011-6081-000	**36,99 €**



Basic device
(without accessories)



Immersion / screw-in
temperature sensor
with immersion sleeve
(accessories)



Duct temperature sensor
with mounting flange
(accessories)





THERMASGARD® TM 43

Temperature measuring transducer (basic device),
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
TM 43-U xx	**active**	**IP 54**	
TM43-U 50mm	0 -10 V	1101-7111-0019-900	**74,46 €**
TM43-U 100mm	0 -10 V	1101-7111-0029-900	**75,68 €**
TM43-U 150mm	0 -10 V	1101-7111-0039-900	**76,79 €**
TM43-U 200mm	0 -10 V	1101-7111-0049-900	**77,16 €**
TM43-U 250mm	0 -10 V	1101-7111-0059-900	**78,44 €**
TM43-U 300mm	0 -10 V	1101-7111-0069-900	**79,72 €**
TM 43-U LCD xx	**active**	**IP 54 (Display)**	
TM43-U 50mm **LCD**	0 -10 V	1101-7111-2019-900	**142,81 €**
TM43-U 100mm **LCD**	0 -10 V	1101-7111-2029-900	**144,02 €**
TM43-U 150mm **LCD**	0 -10 V	1101-7111-2039-900	**145,14 €**
TM43-U 200mm **LCD**	0 -10 V	1101-7111-2049-900	**145,51 €**
TM43-U 250mm **LCD**	0 -10 V	1101-7111-2059-900	**147,58 €**
TM43-U 300mm **LCD**	0 -10 V	1101-7111-2069-900	**148,06 €**
TM 43-I xx	**active**	**IP 54**	
TM43-I 50mm	4...20 mA	1101-7112-0019-900	**74,46 €**
TM43-I 100mm	4...20 mA	1101-7112-0029-900	**75,68 €**
TM43-I 150mm	4...20 mA	1101-7112-0039-900	**76,79 €**
TM43-I 200mm	4...20 mA	1101-7112-0049-900	**77,16 €**
TM43-I 250mm	4...20 mA	1101-7112-0059-900	**78,44 €**
TM43-I 300mm	4...20 mA	1101-7112-0069-900	**79,72 €**
TM 43-I LCD xx	**active**	**IP 54 (Display)**	
TM43-I 50mm **LCD**	4...20 mA	1101-7112-2019-900	**142,81 €**
TM43-I 100mm **LCD**	4...20 mA	1101-7112-2029-900	**144,02 €**
TM43-I 150mm **LCD**	4...20 mA	1101-7112-2039-900	**145,14 €**
TM43-I 200mm **LCD**	4...20 mA	1101-7112-2049-900	**145,51 €**
TM43-I 250mm **LCD**	4...20 mA	1101-7112-2059-900	**147,58 €**
TM43-I 300mm **LCD**	4...20 mA	1101-7112-2069-900	**148,06 €**

ACCESSORIES

for basic device TF 43 / TM 43





Type / WG01B	Item No.	Price
Immersion sleeves		
TH 08-ms / xx (T_{max} +150 °C)	Brass nickel-plated	
TH08-MS 50MM	7100-0011-0010-132	**12,90 €**
TH08-MS 100MM	7100-0011-0020-132	**13,50 €**
TH08-MS 150MM	7100-0011-0030-132	**14,60 €**
TH08-MS 200MM	7100-0011-0040-132	**15,62 €**
TH08-MS 250MM	7100-0011-0050-132	**18,09 €**
TH08-MS 300MM	7100-0011-0060-132	**18,90 €**
TH08-MS 350MM	7100-0011-0070-132	**19,40 €**
TH08-MS 400MM	7100-0011-0080-132	**19,90 €**
TH 08-VA / xx (T_{max} +600 °C)	Stainless steel V4A (1.4571)	
TH08-VA 50MM	7100-0012-0010-132	**22,24 €**
TH08-VA 100MM	7100-0012-0020-132	**24,50 €**
TH08-VA 150MM	7100-0012-0030-132	**26,50 €**
TH08-VA 200MM	7100-0012-0040-132	**27,80 €**
TH08-VA 250MM	7100-0012-0050-132	**34,60 €**
TH08-VA 300MM	7100-0012-0060-132	**36,20 €**
TH08-VA 350MM	7100-0012-0070-132	**36,90 €**
TH08-VA 400MM	7100-0012-0080-132	**37,90 €**
Mounting flanges	Plastic	
MF-15-K Ø 15.2 mm (T_{max} +100 °C)	7100-0032-0000-000	**6,30 €**

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THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors

Type / WG03B	Output	Item No.	Price
ATF 01 xx	**passive**	**IP 54**	
ATF01 Pt1000		1101-1030-5001-000	**18,44 €**
ATF01 Ni1000		1101-1030-9001-000	**19,26 €**
ATF01 NiTK		1101-1031-0001-000	**22,35 €**
ATF01 LM235Z		1101-1032-1001-000	**16,23 €**
ATF01 NTC1,8K		1101-1031-2001-000	**14,96 €**
ATF01 NTC10K		1101-1031-5001-000	**14,96 €**
ATF01 NTC20K		1101-1031-6001-000	**14,96 €**



THERMASGARD® ATM 2-SD

Outside temperature / wet room temperature measuring transducers
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
ATM 2-SD	**active**	**IP 54**	
ATM2-SD-U	0 -10 V	1101-1191-0009-900	**88,17 €**
ATM2-SD-I	4...20 mA	1101-1192-0009-900	**88,17 €**



THERMASGARD® ALTF 02

Surface contact temperature sensors / tube contact temperature sensors,
compact variant

Type / WG03B	Output	Item No.	Price
ALTF 02 xx	**passive**	**IP 54**	
ALTF02 Pt1000		1101-1010-5001-000	**22,30 €**
ALTF02 Ni1000		1101-1010-9001-000	**22,68 €**
ALTF02 NiTK		1101-1011-0001-000	**25,97 €**
ALTF02 LM235Z		1101-1012-1001-000	**22,95 €**
ALTF02 NTC1,8K		1101-1011-2001-000	**21,63 €**
ALTF02 NTC10K		1101-1011-5001-000	**21,63 €**
ALTF02 NTC20K		1101-1011-6001-000	**21,63 €**



THERMASGARD® ALTM 1-SD

Surface contact / tube contact temperature measuring transducers,
compact variant,
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
ALTM1-SD	**active**	**IP 54**	
ALTM1-SD-U	0 -10 V	1101-6141-0219-920	**86,72 €**
ALTM1-SD-I	4...20 mA	1101-6142-0219-920	**86,72 €**



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THERMASGARD® ALTF1

Surface contact temperature sensors / tube contact temperature sensors,
with detached sensor head,
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
ALTF1 xx	**passive**	**IP65**	
ALTF1 Pt1000 PVC 1,5M		1101-6020-5211-110	**20,86 €**
ALTF1 Ni1000 PVC 1,5M		1101-6020-9211-110	**21,63 €**
ALTF1 NiTK PVC 1,5M		1101-6021-0211-110	**22,43 €**
ALTF1 LM235Z PVC 1,5M		1101-6022-1211-110	**22,03 €**
ALTF1 NTC1,8K PVC 1,5M		1101-6021-2211-110	**21,38 €**
ALTF1 NTC10K PVC 1,5M		1101-6021-5211-110	**21,38 €**
ALTF1 NTC20K PVC 1,5M		1101-6021-6211-110	**21,38 €**

THERMASGARD® ALTM2-SD

Surface contact / tube contact temperature measuring transducers,
with detached sensor head,
calibratable, with multi-range switching
(L = 50 mm, cable material: silicone, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
ALTM2-SD	**active**	**IP54**	
ALTM2-SD-U	0 -10 V	1101-6151-0219-920	**85,85 €**
ALTM2-SD-I	4...20 mA	1101-6152-0219-920	**85,85 €**



THERMASGARD® HTF 50

Sleeve temperature sensors / cable temperature sensors
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
HTF 50 xx	**passive**	**IP65**	
HTF50 Pt1000 PVC 1,5M		1101-6030-5211-110	**16,60 €**
HTF50 Ni1000 PVC 1,5M		1101-6030-9211-110	**16,13 €**
HTF50 NiTK PVC 1,5M		1101-6031-0211-110	**20,33 €**
HTF50 LM235Z PVC 1,5M		1101-6032-1211-110	**14,44 €**
HTF50 NTC1,8K PVC 1,5M		1101-6031-2211-110	**13,64 €**
HTF50 NTC10K PVC 1,5M		1101-6031-5211-110	**13,64 €**
HTF50 NTC20K PVC 1,5M		1101-6031-6211-110	**13,64 €**

THERMASGARD® HFTM-SD

Sleeve sensors with temperature measuring transducer,
calibratable, with multi-range switching
(L = 50 mm, cable material: PVC, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
HFTM-SD	**active**	**IP54**	
HFTM-SD-U	0 -10 V	1101-6161-0219-920	**83,29 €**
HFTM-SD-I	4...20 mA	1101-6162-0219-920	**83,29 €**

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THERMASGARD® RTF1-SD

Room temperature sensors without operating elements

Type / WG03B	Output	Item No.	Price
RTF1-SD xx	**passive**	**IP30**	
RTF1-SD Pt1000		1101-40D0-5000-000	**20,03 €**
RTF1-SD Ni1000		1101-40D0-9000-000	**19,66 €**
RTF1-SD NiTK		1101-40D1-0000-000	**22,77 €**
RTF1-SD LM235Z		1101-40D2-1000-000	**18,44 €**
RTF1-SD NTC1,8K		1101-40D1-2000-000	**16,79 €**
RTF1-SD NTC10K		1101-40D1-5000-000	**16,79 €**
RTF1-SD NTC10K (B=3695K)		1101-40D1-9000-000	**16,79 €**
RTF1-SD NTC20K		1101-40D1-6000-000	**16,79 €**



THERMASGARD® RTM1-SD

Room temperature measuring transducers without operating elements

Type / WG01B	Output	Item No.	Price
RTM1-SD	**active**	**IP30**	
RTM1-SD-U	0 -10 V	1101-41D1-0000-200	**75,29 €**
RTM1-SD-I	4...20 mA	1101-41D2-0000-200	**75,29 €**

THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor
including mounting flange
(Measuring rod: reinforeced thermoplastic tube, NL = 3m / 6m)

Type / WG03B	Output	Item No.	Price
MWTF-SD xx	**passive**	**IP54**	
MWTF-SD Pt1000 3m		1101-3050-5231-200	**97,47 €**
MWTF-SD Pt1000 6m		1101-3050-5261-200	**108,44 €**



THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
(Measuring rod: reinforeced thermoplastic tube, NL = 3m / 6m)

Type / WG01B	Output	Item No.	Price
MWTM-SD-U	**active**	**IP54**	
MWTM-SD-U 3m	0 -10 V	1101-3131-0239-90K	**165,27 €**
MWTM-SD-U 6m	0 -10 V	1101-3131-0269-90K	**175,50 €**
MWTM-SD-I	**active**	**IP54**	
MWTM-SD-I 3m	4...20 mA	1101-3132-0239-90K	**165,27 €**
MWTM-SD-I 6m	4...20 mA	1101-3132-0269-90K	**175,50 €**

THERMASREG® FST

Frost protection thermostats, mechanical, one-step,
with switching output
(length of capillary 3m / 6m, incl. mounting clamps)

Type / WG03B	Output	Item No.	Price
FST-xxD	**switching**	**IP65**	
FST-1D 6m		1102-1021-0102-000	**89,76 €**
FST-5D 3m		1102-1022-0102-000	**87,32 €**



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HYGRASGARD® RFTF-SD

Room humidity and temperature sensors (±2%), calibratable

Type/WG01B	Output	Item No.	Price
RFTF-SD	**active (2x)**	**IP30**	
RFTF-SD-U	0 -10 V	1201-41D1-1000-000	**118,17 €**
RFTF-SD-I	4...20 mA	1201-41D2-1000-000	**118,17 €**



HYGRASGARD® KFF-SD
HYGRASGARD® KFTF-SD

Duct humidity and temperature sensors (±2%), including mounting flange, calibratable, with multi-range switching

Type/WG01B	Output	Item No.	Price
KFF-SD	**active**	**IP54**	
KFF-SD-U	0 -10 V	1201-3181-0000-029	**167,18 €**
KFF-SD-I	4...20 mA	1201-3182-0000-029	**167,18 €**
KFTF-SD	**active (2x)**	**IP54**	
KFTF-SD-U	0 -10 V	1201-3181-1000-029	**171,76 €**
KFTF-SD-I	4...20 mA	1201-3182-1000-029	**171,76 €**



HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors (±2%), calibratable, with multi-range switching

Type/WG01B	Output	Item No.	Price
AFF-SD	**active**	**IP54**	
AFF-SD-U	0 -10 V	1201-1121-0000-100	**186,19 €**
AFF-SD-I	4...20 mA	1201-1122-0000-100	**186,19 €**
AFTF-SD	**active (2x)**	**IP54**	
AFTF-SD-U	0 -10 V	1201-1121-1000-100	**190,13 €**
AFTF-SD-I	4...20 mA	1201-1122-1000-100	**190,13 €**



HYGRASREG® KW-SD

Condensation control switches including strap

Type/WG01B	Output	Item No.	Price
KW-SD	**switching**	**IP54**	
KW-W-SD	Changeover contact	1202-1075-0001-020	**108,78 €**

BASIC

S+S REGELTECHNIK

Range of preferential items permanently available from stock
in standard design with S+S company logo

PREMASGARD® 212x-SD

Pressure, differential pressure and volume flow measuring transducers,
with / without display, including connection set,
adjustable, calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
max. – 1000...+ 1000 Pa	**active**	**IP 54**	
PREMASGARD **2121**-SD	0-10 V / 4...20 mA	1301-11B7-0010-000	**140,58 €**
PREMASGARD **2121**-SD **LCD** (Display)	0-10 V / 4...20 mA	1301-11B7-2010-000	**190,62 €**
max. – 5000...+ 5000 Pa	**active**	**IP 54**	
PREMASGARD **2125**-SD	0-10 V / 4...20 mA	1301-11B7-0050-000	**140,58 €**
PREMASGARD **2125**-SD **LCD** (Display)	0-10 V / 4...20 mA	1301-11B7-2050-000	**190,62 €**
max. – 100...+ 100 Pa	**active**	**IP 54**	
PREMASGARD **2120**-SD	0-10 V / 4...20 mA	1301-11B7-0110-000	**140,58 €**
PREMASGARD **2120**-SD **LCD** (Display)	0-10 V / 4...20 mA	1301-11B7-2110-000	**190,62 €**





PREMASREG® DS 2

Mechanical differential pressure switches for air,
with / without connection set

Type / WG03B	Pressure range	Item No.	Price
DS2 incl. connection set		**IP 54**	
DS-205 F	20 ... 300 Pa	1302-4026-0000-000	**36,16 €**
DS-205 B	50 ... 500 Pa	1302-4022-0000-000	**36,16 €**
DS-205 D	100 ... 1000 Pa	1302-4027-0000-000	**36,16 €**
DS-205 E	500 ... 2000 Pa	1302-4028-0000-000	**36,16 €**
DS2 without connection set		**IP 54**	Multipack
DS-205 F	20 ... 300 Pa	1302-4026-1000-**M40**	**24,52 €**
DS-205 B	50 ... 500 Pa	1302-4022-1000-**M40**	**24,52 €**
DS-205 D	100 ... 1000 Pa	1302-4027-1000-**M40**	**24,52 €**
DS-205 E	500 ... 2000 Pa	1302-4028-1000-**M40**	**24,52 €**
M40 = Special price per piece in the multi-pack (40 pieces)			



AERASGARD® KCO2-SD

Duct CO2 sensors,
including mounting flange

Type / WG02B	Output	Item No.	Price
KCO2-SD	**active**	**IP 65**	
KCO2-SD-U	0-10 V	1501-3160-1001-200	**246,49 €**



AERASGARD® RCO2-SD

Room CO2 sensors,
self-calibrating

Type / WG02B	Output	Item No.	Price
RCO2-SD	**active**	**IP 30**	
RCO2-SD-U	0-10 V	1501-61A0-1001-200	**216,00 €**



NOTE

All devices supplied display the company logo of S+S Regeltechnik GmbH as standard!
Neutral versions without the logo printed are available on request!

ORDER PLACEMENT

Orders can be placed in writing, by phone, by fax, or by e-mail. In doing so, the requested items shall be identified by denomination and quantities ordered and also the requested delivery date shall be stated. Special orders must generally be placed in writing, precisely specifying all requested special features. Or order directly ONLINE at **www.SplusS.de**!

DELIVERY PERIODS

The catalogue items are available from stock in partial quantities – subject to prior sale.
Delivery dates for large and special orders are determined after receipt of order / release order and mutual agreement.
We reserve the right to make partial deliveries. Events of force majeure such as difficulties in procurement of materials, strikes, etc. entitle us to withdraw from the contract.

TRADEMARK PROTECTION RIGHTS

S+S Regeltechnik GmbH, S+S logo and S+S brand names are trademarks registered in the register at the German Patent and Trademark Office and must not be used in other publications without the trademark owner's prior written consent.
All other product and company names mentioned here are brands or trademarks of the respective proprietors.

INFRINGEMENT OF INDUSTRIAL PROPERTY RIGHTS

Registered trademarks, trade names and general descriptive names are used in this product catalogue.
Even if these are not expressly marked as such, the pertinent protection provisions and copyrights shall nevertheless apply.

ATTENTION!

We generally only supply commercial, retail and industrial customers. We do not sell to the general public!

Our General Terms and Conditions of Sale and Delivery are applicable in all cases!
This price list supersedes all previous price lists.

LEGAL NOTICE

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Editor: S+S Regeltechnik GmbH, Mr. Tino Schulze and Mr. Heiko Linke, managing directors

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S+S Regeltechnik GmbH
General Terms and Conditions of Sale and Delivery
valid as of May 2021

S+S REGELTECHNIK

1. Scope

(1) Any and all quotations, services and agreements are solely made or performed on the basis of these General Terms and Conditions of Sale and Delivery of S+S Regeltechnik GmbH (S+S) in their respective valid version. These General Terms and Conditions of Sale and Delivery apply solely to companies as defined by the BGB (German Civil Code).

(2) Customers' terms and conditions conflicting with or deviating from these General Terms and Conditions of Sale and Delivery will be acknowledged by S+S only if S+S has expressly consented to the validity of such terms in writing. The General Terms and Conditions of Sale and Delivery of S+S shall also apply if services have been provided to the customer without reservation in the knowledge of conflicting or deviating terms of that customer.

(3) These General Terms and Conditions of Sale and Delivery of S+S shall be acknowledged by the customer's order placement or acceptance of services provided for the duration of the entire business relationship, even if these terms are not explicitly restated.

2. Quotation / contract conclusion / termination of contract

(1) The quotations made by S+S are non-binding. A contract is concluded by the written order confirmation or the delivery of goods ordered insofar as S+S does not indicate via other circumstances that the order has been accepted. Insofar as the customer communicates change requests following receipt of the order confirmation, S+S is entitled to charge the additional costs resulting from this if it accepts such changes.

(2) Illustrations, drawings and other specifications are only binding if agreed upon in writing. The same applies to advisory or informative discussions between S+S and the customer, in particular regarding the possible uses of goods ordered.

3. Services / dates

(1) Delivery deadlines are only binding (fixed date transaction), if S+S has expressly confirmed this in writing.

(2) The adherence to binding delivery deadlines presupposes the clarification of all technical and other issues as well as the timely and proper performance of any obligations by the customer.

(3) S+S shall not be held responsible for delays in delivery for reasons beyond the control of S+S, specifically unforeseeable events that prevent or impede timely delivery. In such cases, the delivery deadline shall be extended accordingly. In the event of a delay of performance, the customer is entitled to withdraw from the non-performed part of the contract insofar as such impediment to performance continues for more than 6 weeks and a reasonable grace period for delivery has been granted. The customer's claims for damages due to the extension of the delivery deadline or if S+S is exempted from its duty to perform are excluded, insofar as the customer was notified without delay of such impediment to performance.

(4) Insofar as S+S is responsible for the non-compliance with binding delivery dates, the liability of S+S shall be limited to 0.5 % of the order value for each full week of delay, but up to a maximum of 5 % of the order value of the delivery affected. The customer can only assert further claims for damages insofar as the customer has granted S+S a reasonable grace period in writing and such delay in delivery is attributable to gross negligence or intent on part of S+S.

(5) S+S is exempt from its delivery obligation if circumstances come to light during the contractual relationship that give just cause to doubt the solvency of the customer. In this case, S+S will perform the delivery insofar as the customer makes an advance payment in respect of the purchase price, or provides appropriate sureties.

(6) Insofar as the customer orders goods on call (in particular, pre-order), the full acceptance of the purchase or the full release order respectively shall be completed within 12 months of the date of contract conclusion or order respectively. Otherwise, the customer is obligated to accept the goods within 10 working days insofar as S+S requests this in writing.

(7) The failure to comply with the time limit mentioned in number (6) will trigger the legal consequences of default of acceptance as defined in the BGB.

(8) There is no general right to return goods no longer required by the purchaser or for the purpose of stock reduction.

4. Delivery

(1) Shipment of goods is effected ex principal office of S+S at the customer's risk and expense (Incoterms 2010: EXW). S+S shall only take out transport, breakage, theft, or other insurance at the written request of the customer. The resulting costs shall be charged to the customer's account.

(2) Insofar as delivery of the goods is to be carried out at a later date than the possible date of shipment at the customer's request, S+S is entitled to charge the costs of storage to the customer's account, starting one month after the notification of readiness for delivery at a flat rate at 0.5 % of the order value for each month, subject to the provision of other evidence. One month after notification of readiness for delivery, S+S is alternatively entitled to request the customer to accept the goods and, in case of non-acceptance, to dispose of the goods in another manner. The customer is then to be supplied within a reasonably extended deadline.

(3) Partial performances are permissible insofar as this is not unreasonable to the customer.

5. Prices / payment terms

(1) The prices of S+S are subject to the statutory value added tax at the respective rate in effect, ex principal office of S+S and plus transport/shipping and packaging costs to be separately charged. For orders of less than EUR 75.00 in value, we reserve the right to charge a low-quantity surcharge in the amount of EUR 15.00. For custom-made items, we charge setup expenditure at cost.

Existing customers whose previous payment was received more than 12 months ago as well as new customers from Germany are supplied two times subject to prepayment and then, after a positive creditworthiness check by our Euler Hermes trade credit default insurance, by payment on account. Deliveries to customers outside Germany are subject to prepayment.

(2) S+S is entitled to issue partial invoices in accordance with the progress of the order.

(3) The invoice amount is due for payment on receipt of the invoice. Insofar as payment is not effected within 14 working days of the date of performance of goods and receipt of the invoice, the customer shall be deemed to be in default. All payments must be made in EUR. Notwithstanding evidence of further damages, the customer in the case of payment default shall pay interest on arrears at a rate of 8 percentage points above the respective base rate.

(4) Bills of exchange and checks are only accepted as conditional payment and take fulfilling effect only after being unconditionally credited. Possible ancillary costs arising due to payment by bills of exchange or check shall be charged to the customer.

6. Warranty entitlements of the purchaser

(1) The rights of the purchaser regarding material defects and defects of title (including incorrect and under-delivery as well as improper assembly or incorrect assembly instructions) shall be based on the statutory provisions, unless otherwise agreed below. The special statutory provisions for final delivery of the unprocessed goods to a consumer, even if this consumer has further processed these goods, shall remain unaffected in all cases (supplier regress according to §§ 478 BGB). Claims arising from the supplier regress are excluded if the defective goods were subject to further processing, e.g. by installation in another product, by the customer or another company.

(2) Our liability for defects is based primarily on the agreement reached concerning the quality of the goods. All product descriptions and manufacturer's specifications that form part of an individual contract or that were published by us (specifically in catalogues or on our website) at the time of contract conclusion are deemed to be agreements concerning the quality of the goods.

(3) Insofar as the quality was not agreed, the existence of a defect shall be evaluated according to the statutory provision (§ 434 par. 1 p. 2 and 3 BGB). However, we accept no liability for public statements by third parties (e.g., advertising statements) to which the customer has not drawn our attention as having influenced his/her purchasing decision.

(4) In principle, we accept no liability for defects that the customer is aware of, or unaware of due to gross negligence, at the time of conclusion of the contract (§ 442 BGB). Furthermore, the customer's claims for defects require that the customer has fulfilled his/her statutory examination and reporting obligations (§§ 377, 381 German Commercial Code (HGB)). In the case of goods intended for installation or other further processing, an investigation must be carried out in all cases immediately prior to processing. If a defect is discovered during the delivery, the investigation or at any subsequent time, we must be notified of this in writing immediately. In all cases, obvious defects must be reported in writing within 5 working days of delivery and non-visible defects undiscovered during the investigation must be reported in writing within the same period following discovery. If the customer fails to carry out a proper investigation and/or report defects, our liability for defects that are not reported, not reported in time or not reported properly shall be excluded in accordance with the statutory provisions.

(5) If the item delivered is defective, we can initially choose whether to provide subsequent performance by eliminating the defect (rectification) or by delivering a defect-free item (replacement delivery). This does not affect our right to refuse subsequent performance in accordance with statutory requirements.

(6) S+S is entitled to refuse subsequent performance if this is only possible at disproportionate costs. Disproportionate costs are deemed to apply if the costs of subsequent performance, including the cost of removing the defective item and installing a defect-free item, exceed the value of the goods in their defect-free condition by 200 %.

(7) S+S is entitled to make the subsequent performance owed dependent on the purchaser paying the purchase price due. However, the purchaser is entitled to withhold a portion of the purchase price that is commensurate with the defect.

(8) The purchaser must provide us with the necessary time and opportunity to carry out the subsequent performance owed and, in particular, must hand over the rejected goods to us. In the event of a replacement delivery, the purchaser must return the defective item to us in accordance with the statutory provisions.

(9) In the case of subsequent performance, S+S itself shall remove the defective item and install the defect-free item. The customer is only entitled to remove the defective item and to install a defect-free item with the prior consent of S+S or following the expiry of an appropriate deadline set by the customer. Insofar as a defect actually exists, we will bear or reimburse in accordance with statutory provisions the expenditure incurred for the purpose of inspection and subsequent performance, in particular, transport, travel, labour and material costs as well as any applicable removal and installation costs. Otherwise, we are entitled to demand reimbursement from the customer for the costs incurred due to the unwarranted request for defect rectification (in particular, inspection and transport costs), unless the purchaser was unable to ascertain the freedom from defects.

(10) If the subsequent performance has failed or if an appropriate deadline to be set by the customer for the subsequent performance has expired without success or is dispensable in accordance with the statutory provisions, the purchaser is entitled to withdraw from the contract or reduce the purchase price. However, the right of withdrawal does not apply for insignificant defects.

(11) Claims by the purchaser for damages or compensation for wasted expenditure apply even for defects only in accordance with § 8 and are excluded in all other cases.

7. Warranty

(1) S+S grants a warranty for products that the customer has purchased on or after 1 January 2021 subject to the following provisions. This warranty is provided to customers in addition to and independently of their statutory entitlements in the event of defects.

(2) S+S will rectify any faults in the design, material or workmanship by repair or replacement delivery within 5 years of delivery. The usual signs of wear, especially due to corrosion, ageing as well as ambient and environmental influences, are excluded from the warranty.

(3) The warranty only covers the repair or replacement delivery at the discretion of S+S. The warranty does not cover the removal of the defective item and installation of the new defect-free item.

(4) The assertion of warranty claims requires that the product be purchased on or after 1 January 2021 and was installed and maintained by a qualified technician in compliance with the mounting and operation handouts of S+S.

(5) The warranty shall expire if the fault is caused by improper installation, operating, usage or handling, or if the product was subject to structural modifications after it was purchased or was repaired or modified using third-party components.

(6) When a warranty claim is submitted, the product must be sent, securely packaged, accompanied by a complaint number that must be requested from S+S by telephone or by e-mail to "S+S Regeltechnik GmbH, Reklamationsabteilung, Thurn-und-Taxis-Str. 22, D-90411 Nürnberg, Germany". The customer bears all shipping costs. The copy of the invoice with purchase date and the completed "Form for Returns", which can be downloaded at https://spluss.de/en/downloads/, must be enclosed with the shipment.

8. Liability

(1) Unless otherwise specified in these General Terms and Conditions of Sale and Delivery including the following previsions, S+S shall be liable for breaches of contractual and non-contractual obligations in accordance with the statutory provisions.

(2) S+S is liable for damages – irrespective of the legal grounds – in the case of fault-based liability arising from intent and gross negligence. In the case of simple negligence, S+S shall be liable based on a more lenient liability standard in accordance with statutory provisions (e.g., for care and attention regarding internal matters) only

a) for damage arising from the injuries to life and limb or to health;

b) for damage arising from the violation of a material contractual obligation, the fulfilment of which enables the proper execution of the contract in the first place and on whose fulfilment the customer can normally rely on and is entitled to rely on; in this case, however, liability is limited to compensation of the typically foreseeable level of damage.

(3) The liability limitations arising from number 8 (2) also apply for breaches of duty by or in favour of persons for whose fault S+S is responsible in accordance with statutory provisions. They shall not apply insofar as S+S has maliciously concealed a defect or has assumed a warranty for the quality of the goods and for claims by the customer in accordance with the German Product Liability Act.

(4) S+S can only be held liable for deliberate breach of duty and not for any consequential damage caused by further processing of unsuitable or defective goods.

9. Limitation period

(1) Contrary to § 438 par. 1 no. 3 BGB, the general limitation period for claims arising from material defects and defects of title is one year after delivery.

(2) However, if the good in question is a building or an item that has been used in accordance with its customary purpose for a building and has caused it to be defective (building material), the limitation period according to the statutory provision is 5 years of delivery (§ 438 par. 1 no. 2 BGB). Additional statutory special regulations regarding the limitation period, especially in accordance with § 438 par. 1 no. 1 BGB, also remain unaffected if S+S has maliciously concealed the defect or assumed a warranty for the quality of the goods (§ 438 par. 3, § 444 BGB) or in the case of supplier regress in the sale of consumer goods in accordance with §§ 478, 479 BGB.

(3) The above limitation periods specified in legislation covering the sale of goods also apply for contractual and non-contractual claims for compensation by the customer that are based on a defect of the goods, unless application of the normal statutory limitation period (§§ 195, 199 BGB) would in this particular case result in a shorter limitation period. Claims for compensation by the customer in accordance with number 8 (2) clause 1 and clause 2 (a) and in accordance with the product liability law shall come under the statute of limitations exclusively in accordance with the statutory limitation periods.

10. Retention of title

(1) The goods delivered shall remain the property of S+S until the complete settlement of any and all claims by the customer. If the customer sells reserved goods without receiving the purchase price from its buyers on a payment-on-delivery basis or in advance, the customer shall agree the reservation of title with its buyers in accordance with these provisions.

(2) The customer is not entitled to pledge the reserved goods or to transfer them as collateral. In the event of seizures or other interventions by third parties, the customer shall notify S+S in writing without delay.

(3) The customer is entitled to resell reserved goods during the course of its regular business operations. The customer now already assigns to S+S all receivables in the amount of the total invoice amount (including VAT) of the claim that are accruing to the customer from its buyers from the resale, irrespective of whether such goods are sold either without or after processing. The customer is also still entitled to collect the receivable after assignment, although this does not affect the entitlement of S+S to collect the outstanding amount itself. However, S+S undertakes to the customer not to collect the outstanding amount as longas the customer does not fall behind with payments, or an application to initiate a judicial settlement or insolvency proceedings has not been filed. If this is the case, the customer is obligated at the request of S+S to disclose the assigned receivables and their debtors, to provide the necessary records, and to notify the debtors of the assignment.

11. Operating and mounting instructions

The customer undertakes to adhere to any operating and mounting instructions delivered with goods, and to make any third-party buyers aware of same. The complete or partial non-observance of such instructions may result in a complete loss of buyers' rights. This does not apply to possible claims for damages according to § 7.

12. Copyright

The customer is not entitled to reproduce or copy any of the content of S+S catalogues, specifically technical drawings and photographs, for his/her own advertising or other purposes without the express written approval of S+S. The customer is not permitted to make quotations or other commercial documents available to third parties.

13. Miscellaneous

(1) For any disputes arising from or in connection with the contractual relationship, Nuremberg/Germany is agreed as the place of jurisdiction. The place of performance is Nuremberg.

(2) The customer can only offset against claims that are undisputed or have been legally established as final and absolute. The customer is entitled to a right of retention only if its counter-claims originate from the very same contractual relationship, or if such claims are undisputed or have been legally established as final and absolute.

(3) Modifications of the contract must be made in writing. This also applies to the alteration of this written-form requirement clause.

(4) Should one or several provisions of these General Terms and Conditions of Sale and Delivery be ineffective or not have been properly incorporated into the contract, the remaining provisions of these General Terms and Conditions of Sale and Delivery shall remain effective.

(5) Solely the laws of the Federal Republic of Germany shall apply to the exclusion of the law regarding the United Nations Convention on Contracts for the International Sale of Goods (CISG) – also if the customer has its registered office outside Germany.

These General Terms and Conditions of Sale and Delivery are protected by copyright. Copyright infringements will be legally prosecuted.

S+S Certificate

When it comes to quality, we leave nothing to chance. We make sure of this with systematic quality management and uncompromising checks at our in-house testing centre.

In addition, we undergo regular certification by independent inspection authorities and institutions. We are very proud that our quality ‚Made in Germany' also passes the strictest international inspections and tests again and again with flying colours.

Tested safety and certified quality

PROUDLY MADE IN GERMANY

- RoHS conforming materials
- DIN tested / certified devices
- ESD compliant manufacturing
- EAC certified
- CE conformity
- GOST certificates for exports of all products by S+S to the Commonwealth of Independent States and Russia
- UKCA conformity (UK Conformity Assessed)

NEW

Development, manufacturing and sales are certified by TÜV Thüringen according to DIN EN **ISO 9001**:2015 (quality management) and DIN EN **ISO 14001**:2015 (environmental management)


ZERTIFIKAT

für das Managementsystem nach DIN EN ISO 9001:2015 und DIN EN ISO 14001:2015

S + S Regeltechnik GmbH
Thurn-und-Taxis-Straße 22
90411 Nürnberg

Entwicklung, Herstellung und Vertrieb von Sensoren, Fühlern und Feldgeräten für die Gebäude-, Versorgungstechnik und Infrastrukturautomation


CERTIFICATE

for the management system according to ISO 9001:2015 and ISO 14001:2015

S + S Regeltechnik GmbH
Thurn-und-Taxis-Straße 22
90411 Nürnberg / Germany

Development, production and sale of sensors, detectors and field instruments for building, supply technology and infrastructure automation


СЕРТИФИКАТ

соответствия системы менеджмента требованиям стандартов ISO 9001:2015 и ISO 14001:2015

S + S Regeltechnik GmbH
Thurn-und-Taxis-Straße 22
90411 Nürnberg / Германия

Разработка, производство и сбыт сенсоров, зондов, регулирующих и контрольных приборов для автоматизации сооружений и инфраструктуры

You can rely on S+S –
We have the paperwork to prove it!

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СЕРТИФИКАТ СООТВЕТСТВИЯ


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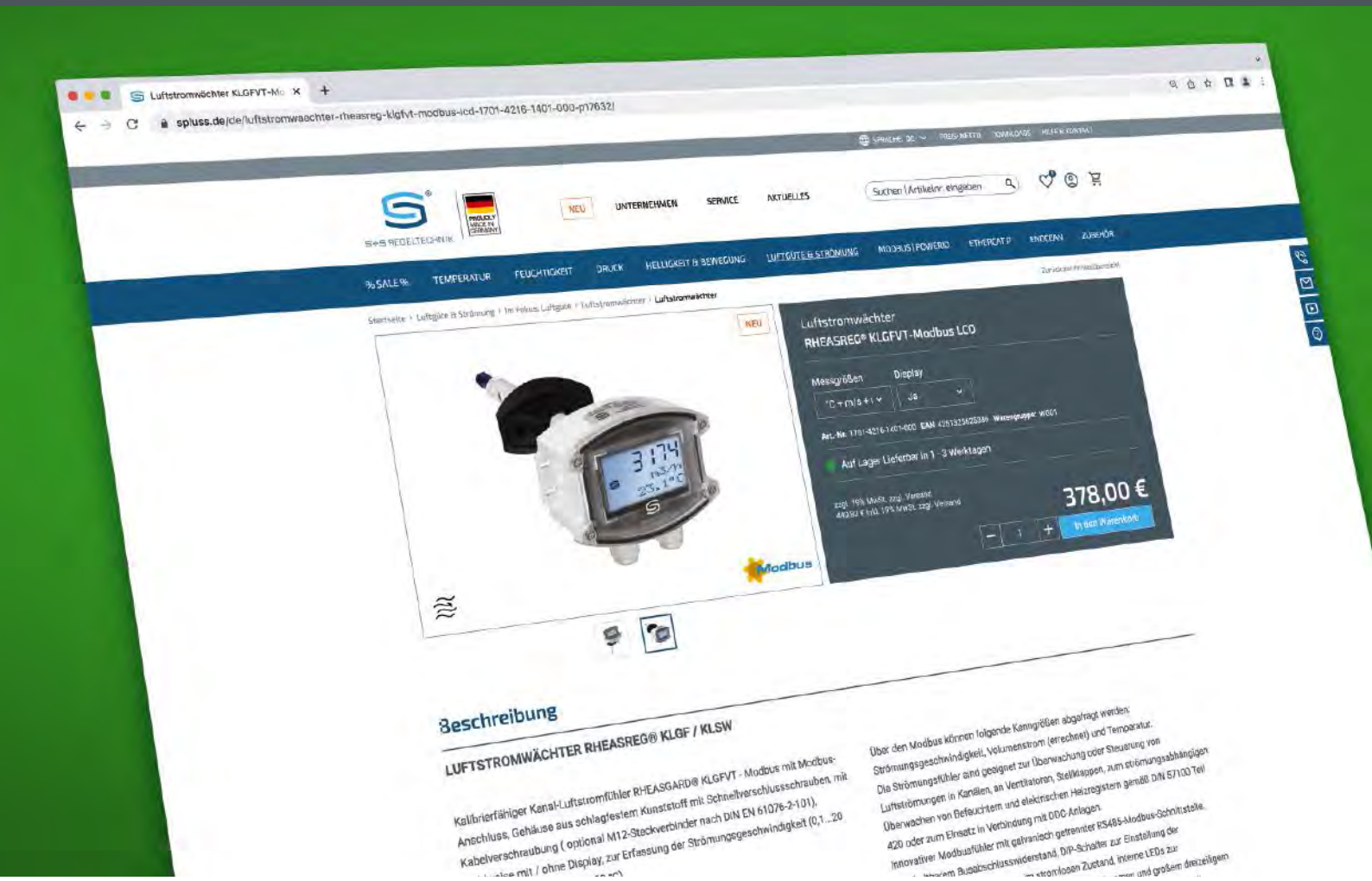
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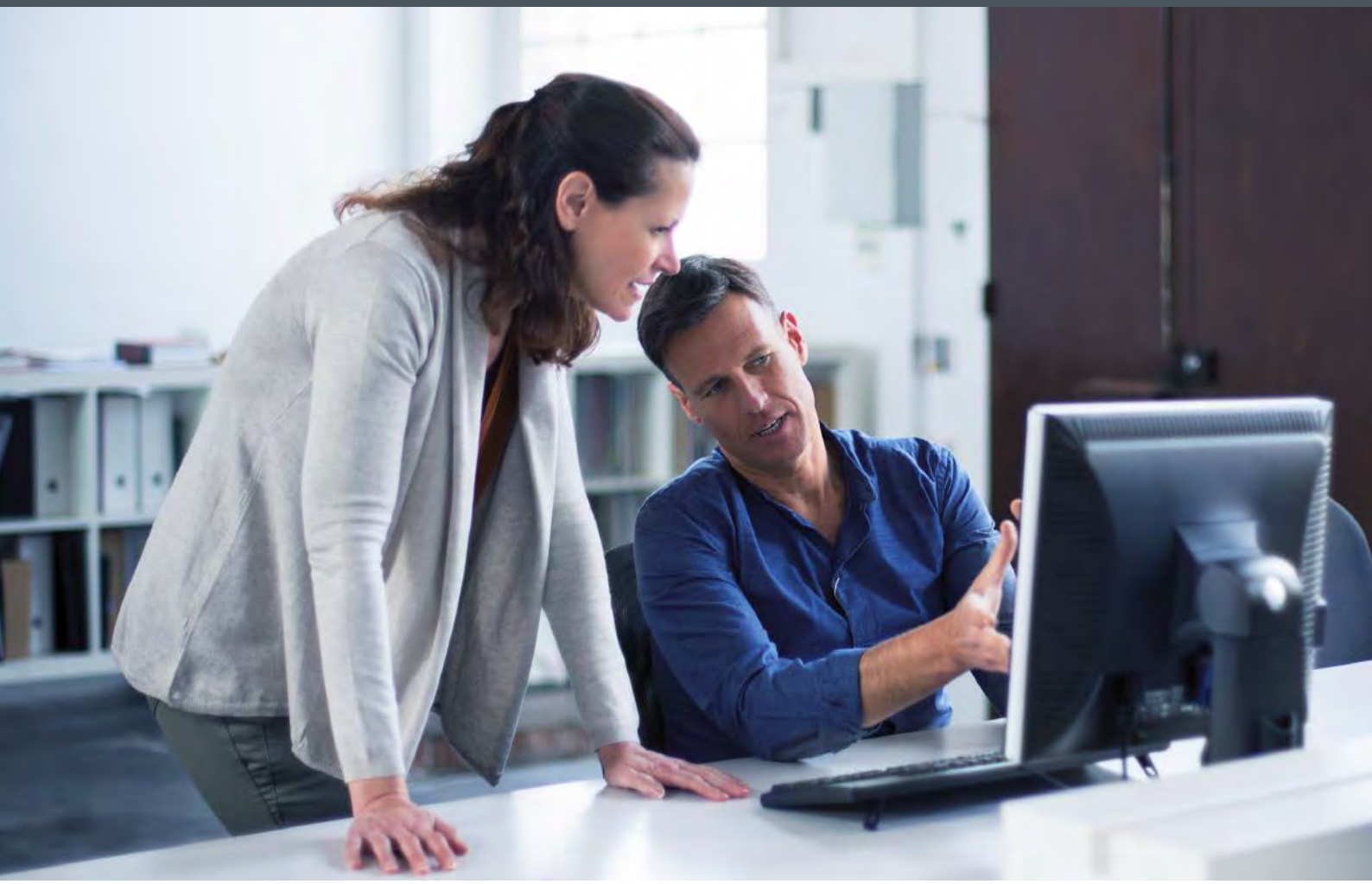
Each of our employees is a specialist in their field and contributes to your satisfaction with their expertise.

Our motivated team will be happy to answer your questions by phone, mail or even online. We look forward to meeting you!

Contact us by phone
+49 (0) 911-519 47-0

Write us an email
mail@SplusS.de

Chat with us at
www.SplusS.de



S+S REGELTECHNIK

FÜHLBARE PRÄZISION

S+S REGELTECHNIK GMBH
THURN-UND-TAXIS-STR. 22
90411 NUREMBERG / GERMANY

PHONE +49 (0) 911 / 519 47-0

mail@SplusS.de
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